Second Klimapolis Workshop Report

20 – 21 December 2018
Climate Service Center Germany (GERICS)
Hamburg, Germany

Max-Planck-Institut
für Meteorologie

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1. Welcome session and Klimapolis overview

The list of participants of the Second Klimapolis workshop can be found in Annex A. The meeting agenda can be found in Annex B.

Guy Brasseur, Klimapolis coordinator, welcomed participants and reminded all that the focus of this workshop would be on climate services and the role that Klimapolis can play in providing the necessary information to a variety of stakeholders. **Nico Caltabiano**, Klimapolis project manager, reminded all about the objectives of the project, which is to develop a long-term networking with scientific actors in the partner countries and the construction of long-term bilateral research structures.

2. Session: Climate services and climate adaptation

Guy Brasseur gave an overview on the fundamental objectives of climate services. The motivation for climate services is steadily developing over many years, as awareness of the importance of climate on many sectors of societies has grown (agriculture, food security, water, health, energy, tourism), and the impacts of extremes have been increasingly recognized, with a growth in disasters losses. Also, the relevance of managing climate risk is being seen increasingly as a central development issue, and the preparedness and associated use of climate information has become a mainstream issue for disaster management. However, the concept of climate services still emerging and challenging. Meaningful climate service must enable climate informed decision-making and climate-smart policy and planning, and must address many technical issues, but also the institutional issues and processes to connect, in a sustained and effective way, providers and users. The attributes of a climate service are:

- Provide balanced, credible, cutting edge scientific and technical information
- Engage a diversity of users in meaningful ways to ensure their needs are being met
- Provide and contribute to science-based products and services to minimize climate-related risks
- Strengthen observations, standards, and data stewardship
- Improve regional and local projections of climate change
- Inform policy options

Idir Bouarar, from the Max Planck Institute for Meteorology (MPI-M), gave a presentation on the provision of air quality forecasts as services, from global to city-scale. In order to understand and reduce risks of poor air quality, it is necessary to have:
- Monitoring: observational networks and field studies to assess levels of air pollution and population exposure
- Modelling: implement appropriate models, tools, and case studies to assist in urban planning
- Forecasting: anticipate specific hazardous conditions in order to take action to improve air quality, to advise the public by e.g. providing Air Quality Indexes.
- Long-term projections: forecast future trends and problem areas in order to inform policy and prepare measures to protect health
- Support policy implementation and decision making: coordination between science and policymakers; Sources and impacts of air pollution and strategies for its mitigation; Socio-Economic Benefits

There are many examples of global and regional air quality services, with the Copernicus Atmosphere Monitoring Service (CAMS) being one of the main ones. CAMS, through the use of particularly satellite data, generates global and regional products, and then can provide useful information via several applications available to several users. High resolution forecasts are also

being done by some private or non-profit companies. Despite recent advances in the provision of services for air quality, there are still many challenges

- Better translate of science to public
- Development products with a distinctive advantage and quality
- Making sustainable products and services
- Find users, provide support and training
- Respond to user needs, and help them to define what they need
- Integrate user requirements and feedback into product/service development
- Provide easy access, discovery, visualisation, manipulation of data
- Continuous service improvements: web and mobile services, documentation, data access, quality of products
- Increase visibility of the products/services: communication, design…
- Well defined business model, especially for city and urban areas

Martin Koehler, from the University of Applied Sciences Hamburg (HAW), talked about Digital tools for Climate Services, and the connection between natural science and transformational science. Technology/sensors have become very cheap so there is an opportunity for sensors to be available everywhere. However, this can bring a different set of problems like the quality of the data. This is dependent on the quality of sensors and how people manipulate or setup those sensors, given that in many cases they are used as part of citizen science projects. It is important to identify anomalies within large heterogenous datasets as they can be just errors or new information. Also, with such large datasets, it is essential that new ways to visualise the highly complex datasets in order to make them available for a wider audience stakeholders.

Maria Manez, from the Climate Service Center Germany (GERICS), led a hands-on activity that showed participants the basics of co-designing climate services activities, from engagement with users, their needs and what it is necessary to provide the information. Participants were split in groups where they could choose a specific issue and develop the service to be provided.

Steffen Bender, from the Climate Service Center Germany (GERICS), gave a presentation on climate change adaptation in cities. In his talk he introduced GERICS' Adaptation Toolkit. Adaptation on a regional level is complex and individual to each case. Not only information on climate is necessary but it is important to understand the legal framework in the country, region and city level. He illustrated the presentation with a couple of examples showing the process taken until delivery of the information, and the tools used to evaluate success.

Gabriela Di Giulio, from the Environmental Health Department oft he University of São Paulo (USP), gave a remote presentation on barriers and opportunities for climate adaptation in large Brazilian cities. She presented the main results of the CiAdapta project that looked at six large Brazilian cities and their adaptive capacity. Several factors affect urban climate adaptation: access to information, organizational elements, resources and cognitive factors. Responding to climate change is a dynamical political process but that provides windows of opportunity because there are alternatives to tackle it and friendly political conditions to incorporate this problem in the decision agenda. As an example for São Paulo, despite several efforts and a well defined Municipal Master Plan, implementation of adaptation strategies has not been successful, mainly due to lack of political will and conflicting values and priorities. There is also a lack of definition of responsibilities, competencies, and priorities in terms of investments and strategic actions, among other problems. In order to change this picture, it is necessary to improve the cooperation between public administration and local academics and researchers, and engage stakeholders and actors of the civil society, economy and private sector groups.

3. Session: Mapping climate services

Pablo Borges de Amorim, from the Brazilian Environment Ministry, gave an overview of the project Enhancing Climate Services for Infrastructutre investments (CSI) that is funded by the Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ). This project is initially mapping climate services in Brazil in order to increase its use in planning and climate risk assessments of infrastructure investments. About 90 institutions responded to a survey that asked about the focus of their services provision and what sector they worked. Studies of the climate system were the main focus of those institutions, with agriculture and water resources the main sector. The next steps of the project will be to develop an online portal (AdaptaCLIMA) that will make available all institutions and groups that are involved in the provision of climate services in Brazil.

A brief discussion with all participants followed. It was mentioned that a similar activity to AdaptaCLIMA is the "Climate Knowledge Hub", which is a European-centred network of climate service providers. One comment made is that not all activities labelled as climate services are such. Some are just the provision of data, without any extraction of the meaning of that information. Therefore, according to a policy brief prepared by Climateurope, a Europe-wide network for researchers, suppliers and users of climate information, it is necessary to have a comprehensive characterization of climate services in order to get a better overview of available climate services and for a gap analysis, and also give (potential) users an overview of available climate services and where to find them.

4. Session: Citizen science

Christopher Bohlens, Walther Prym and Anita Engels presented the activities of "The OK Lab Stuttgart", and how citizens in Hamburg are participating in this citizen science project on fine dust. The OK Lab Stuttgart is part of the Code for Germany program of the Open Knowledge Foundation Germany. The goal is to promote transparency development, open data and citizen science. One of the citizen science projects within The OK Lab Stuttgart is the luftdaten.info (https://luftdaten.info/). In this project, citizens are able to install self-built sensors on the outside their home/office, and the air quality data collected by these sensors are continuously updated on an online database and displayed via an online map interface. Christopher Bohlens showed the technical details of the project and gave five kits to participants. Klimapolis members thanked Christopher for those kits. Walther Prym is a participant in the project and talked about his experience in setting up the kit and showed the data that are collected from his house.

5. Session: Klimapolis future

Guy Brasseur led the discussion on the future of the Klimapolis project. As mentioned at the beginning of the workshop, the objective of this cooperation is to develop a long-term networking with excellent scientific actors between Brazil and Germany and the construction of a long-term bilateral research structure. The initial phase of Klimapolis is funded for 2 years until September 2019, with the second phase potentially funded for an extra 3 years depending on the review by BMBF which will be done after 31st May 2019. For this review, Klimapolis will have to submit a report of activities and future plans.

There is a clear indication and willingness from the University of São Paulo to host the joint institute, particularly because there is already some good working relationship with some German groups part of Klimapolis. However, further discussion will need to take place with several groups within USP to decide the best for the long-term structure. One of the main focus would be on how to transfer climate change and environmental impacts into policy at municipal level.

A road map for the Klimapolis Laboratory has been developed, with the definition of a mission, objectives, research themes, methodologies and products.

a) Laboratory Mission

The Klimapolis Laboratory will develop a joint Brazilian German transdisciplinary research program that, through sustained dialogues with different stakeholders, environmental literacy and social learning, will contribute to the development of environmentally resilient cities in Brazil. The Laboratory will have special focus on the relation between climate, water and air pollution and societal actors, and will co-design with city officials and other urban actors approaches towards the development of sustained cities and improved governance structures.

b) Objectives

The objectives for the Klimapolis Laboratory derive from those described in the initial proposal, taking stock from the discussions that happened in the workshops organised in the implementation phase of the project.

- To co-develop transdisciplinary approaches and strategies that will advance the understanding of impacts and risks due to climate change and other environmental stressors in metropolitan areas, through integration of advanced tools for assessment, monitoring and modelling.

- To advance the understanding of information needs and support local stakeholders via establishment of efficient generation and provision of climate and environmental services

- To identify effective governance frameworks with decision-relevant information, with the aim of co-design with city officials better evidence-based strategies, practices and policies

c) Crosscutting Research themes

Integrative crosscutting themes include research that contributes both to fundamental scientific understanding and to more informed decision making. There are important synergies among the nine themes, and they are not completely independent. For instance, research on climate impacts or air pollution control will clearly contribute to better understanding of both urban planning and stakeholder engagement. Therefore, all the research to be done under all nine themes will benefit from increased dialogue with decision makers across a wide range of sectors and scales.

Research to improve understanding of climate impacts in urban areas

1. Climate change impacts, adaptation and vulnerability
2. Urban climate
3. Flooding, water shortage and other extreme events

Research to advance understanding of environmental impacts on society

4. Air pollution control and source attribution
5. Urban Health
6. Regional urban footprint

Research to improve urban design and stakeholder engagement

7. Urban planning and design from city to neighbourhood scales
8. Social learning
9. Governance including regulations, procedures, accountability

d)Research methodologies and approaches

Research approaches that will be used to develop the integrative research themes will follow qualitative, quantitative, and mixed methods.

- Co-design, co-production and co-development
- Air quality, climate and hydrological modelling and downscaling
- Observing, monitoring and source attribution
- Citizen science
- Governance analysis
- Real life laboratory with circular approach
- Experimental design
- Prototype studies with evaluation

e)Expected deliverables

The expected deliverables for the Klimapolis Laboratory are organised by three main topics: Advancing climate science, Integrating climate and policy, and Changing urban environment

Advancing climate science
- Air quality forecasts and climate projections
- Co-production of papers and institutional reference for climate services
- Webinars

Integrating climate and policy
- Policy briefs
- Best practices handbook and guidelines for stakeholders
- Think Tank and networks

Changing urban environment
- Platform for urban sensing
- Development of physical "change maker spaces" and other experimental interventions

f) Expected impacts

It is expected that the Klimapolis Laboratory impact will be multifaceted and enduring. The road map has been devised and developed for a transdisciplinary approach that will link the research partners with the wider stakeholder community, particularly local governments in Brazil. Moreover, it is envisioned that Klimapolis Laboratory will provide underpinning information for policy makers to work towards reaching the UN sustainable development goals towards environmental resilient cities.

- Develop closer interactions between German and Brazilian climate science communities
- Deliver better evidence-based information for decision making
- Co-develop collaborative practices with local government and citizens
- Provide strengthening awareness on issues related to climate change to different stakeholders
- Move towards convergence science
- Implement synergies and win-win solutions for climate and air pollution; improved strategies for water management.
- Develop new paradigms for urban planning
- Offer direct contribution to C40 and ICLEI activities

ANNEX A – Meeting participants

Name	Institution
Roberta Amaral	HCU (Germany)
Tercio Ambrizzi	USP (Brazil)
Maria de Fatima Andrade	USP (Brazil)
Renato Anelli	USP (Brazil)
Bemjamin Bechtel	UHH (Germany)
Anja Berestetska	TUHH (Germany)
Idir Bouarar	MPI-M (Germany)
Guy Brasseur	MPI-M (Germany)
Nico Caltabiano	MPI-M (Germany)
Camila Camara	HCU (Germany)
Jörg Cortekar	GERICS (Germany)
Hendrik Elbern	RIU (Germany)
Anita Engels	UHH (Germany)
Philipp Franke	RIU (Germany)
Peter Fröhle	TUHH (Germany)
Eduardo Gresse	UHH (Germany)
Judith Hoelzemann	UFRN (Brazil)
Ali Hoshyaripour	KIT (Germany)
Pedro Jacobi	USP (Brazil)
Martin Kohler	HCU (Germany)
Lola Kotova	GERICS (Germany)
Ana Paula Koury	Univ. São Judas Tadeu (Brazil)
Anne-Caroline Lange	RIU (Germany)
Gaby Langedndijk	GERICS (Germany)
Andrea Lopes	HCU (Germany)
Maria Manez	GERICS (Germany)
Vinicius Lionel Mateus	MPI-M (Germany)
Regina Miranda	USP (Brazil)
Sandra Momm	UFABC (Brazil)
Armelle Remedio	GERICS (Germany)
Cristobal Reveco	GERICS (Germany)
Nilton Evora do Rosario	UNIFESP (Brazil)
Christoph Sauer	TUHH (Germany)
Heinke Schluenzen	UHH (Germany)
Ediclê de Souza	RIU (Germany)
Bettina Steuri	GERICS (Germany)
Antje Stokman	HCU (Germany)
Carla Tortelli	HCU (Germany)
Perola Vasconcellos	USP (Brazil)
Daniele Vieira	UNESCO
Mariana Vieira	HCU (Germany)
Kerstin Walz	UHH (Germany)
Martin Wickel	HCU (Germany)
Cathrin Zengerling	HCU (Germany)

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Climate Services Center Germany (GERICS)

Final agenda

Day 1 – Thursday
Venue: Climate Services Center Germany (GERICS)

Session 1: Climate Services and climate adaptation

09:00 – Welcome

09:10 – Overview of climate services (Guy Brasseur, MPI-M)

09:40 – Air quality modelling as services in urban areas (Idir Bouarar, MPI-M)

10:05 – Digital tools for climate services (Martin Koehler, HAW)

10:30 – Coffee break

11:00 – Planning cities with climate services information (Maria Manez, GERICS)
        Activity with break-out groups

12:45 – Lunch

14:00 – Climate change adaptation in cities (Jörg Cortekar, GERICS)

14:30 – Climate adaptation in large Brazilian cities: barriers and opportunities (Gabriela di Giulio, USP) *(remote presentation)*

Session 2: Mapping Climate Services

15:00 – Mapping of Climate Services in Brazil (Pablo Borges de Amorim, GIZ) *(remote presentation)*

15:30 – Coffee break

16:00 – How to map climate services in São Paulo – brainstorming session (Lead: GERICS)
        - Include discussion on necessary tools for climate services

17:30 – End of day

<u>Day 2 – Friday</u>
(Venue: GERICS)

09:00 – Hamburg Citizens participating in citizen data project on fine dust: The "OK Lab Stuttgart"
(Christopher Bohlens, Walther Prym, Anita Engels)

10:30 – Coffee break

11:00 – Discussions on the future "Klimapolis Laboratory" (Chair: Guy Brasseur)

12:30 – End of meeting