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EDITOR'S ADDRESS

Dear readers,

It is our pleasure to present to you the second issue of the newsletter devoted to the FAIRNESS COST Action.

Newsletters have the role of showing and spreading the Action's features and deliverables.

In this second issue, we are pleased to give insight in FAIRNESS summer school which was held in July 2023 in Ghent, Belgium, and to introduce you with our colleagues and participants at summer school Thomas Vergauwen and Peter Marcis.

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ABOUT FAIRNESS

The FAIRNESS action intends to improve standardization and integration between databases/sets of micrometeorological measurements that are part of research projects or local/regional observational networks established for special purposes (agrometeorology, urban microclimate monitoring).

Addressing identified challenges requires an effective transboundary network of researchers, stakeholders (extension services and environmental agencies, local authorities and ministries, SME) and civil society (specialized and general public) from Europe and beyond to identify and fill knowledge gaps, standardize, optimize and promote new environmental-tailored measurement and control procedures, enhance research effectiveness and improve dissemination.

Short Brief about second FAIRNESS summer school

During the first week of July 2023 a second FAIRNESS summer school, entitled 'Analyzing urban microclimate data: from sensor to science', took place in Belgium. It was organized by Prof. Steven Caluwaerts (Ghent University and Royal Meteorological Institute of Belgium) and his team, which has experience in managing several urban measurement networks in Belgium.

The summer school aimed at training young researchers (PhD students and post-docs) in translating urban meteorological measurements into sound scientific analysis. Among other things, quality control, filling data gaps and collecting metadata was discussed. The participants applied the knowledge on a dataset they brought themselves by using the Metobs-toolkit that was developed specifically for this summer school. In addition to the practical sessions, national and international experts gave lectures on measurements in the city. Based on his long-standing expertise, Prof. Lee Chapman (Birmingham University) shared his views and lessons learnt about urban networks. Prof. Gert-Jan Steeneveld (Wageningen University) gave an overview of several applications of urban microclimate data in The Netherlands. The potential and challenges (e.g. quality control) of using crowdsourced data for urban climate research were addressed by dr. Daniel Fenner (University of Freiburg). Dr. Pavel Krc (Institute of Computer Science CAS) introduced microscale urban modelling whereas dr. Rafiq Hamdi (Royal Meteorological Institute of Belgium) focused on studying climate change in cities. Prof. Michael Scriney (Dublin University) demonstrated how datasets can be uploaded to the KSP of the FAIRNESS action. Finally, Prof. Quang Van Doan (University of Tsukuba) discussed the impact of cities on precipitation.

The summer school took place at the Armand Pien Observatory (Ghent University) in the city of Ghent. During the trip to the Royal Meteorological Institute of Belgium in Brussels on Tuesday, the weather room, where the operational forecasts are produced, and the climatological park were visited. There were 20 participants from 16 different European countries and 5 international speakers from the Netherlands, Germany, Ireland, United Kingdom and the Czech Republic.

All presentations will be published online on the FAIRNESS website. The Metobs-toolkit and the supporting materials are freely available online (https://drive.google.com/drive/folders/1xdk-enJm75K-qKsQIEHiLRTd_ovzNz7L?usp=sharing) and a publication describing the software is in preparation.

Prepared by prof. dr. Steven Caluwaerts

FAIRNEES-COST: CA20108 SS2 Summer School, Ghent 2023

Photos provided by prof. dr. Steven Caluwaerts



Thomas Vergauwen, Royal Meteorological Institute of Belgium and Ghent University

BIOGRAPHY

Thomas is a PhD student working on high-resolution weather modelling and non-traditional observations at the Royal Meteorological Institute of Belgium and Ghent University. He has a background in physics, weather and climate modelling, and teaching.

For the 2023 summer school in Ghent, Thomas was the leading developer of the MetObs-toolkit that was used during the exercises.

What was your motivation to be a part of FAIRNES COST action?

It was my supervisor (Prof. Steven Caluwaerts) who introduced me to the action and invited me to join as a working group member. Due to other occupations, my involvement in FAIRNESS was quite limited till the recent summer school in Gent.

Since I am doing research on using non-traditional observations, I know the difficulties and struggles of working with micrometeorological measurements. I found it challenging and time-consuming to collect data and metadata, validate the quality, fill the gaps, synchronize timestamps, etc. Since these are challenges that come back for many COST members, I was eager to join.

What are your expectations from FAIRNESS?

To me, it feels that a lot of the issues with micrometeorological datasets are specific (i.g. instrumentation errors, representation of the observations, data cleaning sharing data, ...), and the expertise is scattered over many groups. I expect this COST action to fuel collaboration and knowledge exchange, and help participants to make their data FAIR through summaries, lectures, workshops, and discussions.

According to you, what is the main contribution of summer school?

For me, the main contribution of the summer school is actually well captured by the title of the summer school: From sensor to science. There was a well-defined structure of practical exercises to achieve scientific insight starting from raw micrometeorological measurements. The exercises guided the participants through the complete process, starting from cleaning their dataset (synchronization, quality control, gap filling) till the applications (scientific analysis and model comparison), which is something all scientists working with these micrometeorological measurements must do.

At the end of the summer school, I was very impressed by the scientific insights the participants had gained based on their observations.

How do you see opportunities in your field of sciences?

From a scientific perspective, I think the KSP could pave the way towards larger, pan-European studies on microclimate. Collecting all datasets on one platform facilitates to (re-)use

data from other groups for other regions and this will strengthen the scientific value of the research. It will also support scientists who are designing a new micrometeorological network to think about data and metadata storage.

I hope that the MetObs-toolkit will be used and further improved by others. There are still a lot of opportunities for new and better methods for cleaning up raw data (especially gap-filling techniques). If these new techniques could be implemented in the toolkit, then these innovations could be directly used by a wider community (of MetObs-toolkit users).

For now, most Urban climate research is focused on (outdoor) temperature observations. I think there are opportunities to study the urban impact on other types of observations (humidity, precipitation,...), but these will come with new challenges.



Peter Marcis
Faculty of Forestry, Technical
university in Zvolen, Slovakia
and Forest Research Institute,
National Forest Centre,
Slovakia

BIOGRAPHY

Dr. Peter Marcis is an early career researcher in the field of Forest Ecology. His main focus are the effects of current climate change on the growth of European tree species. Currently, he is working on projects related to relationships between forest microclimate, biodiversity and productivity in old-growth and managed forest ecosystems, but also modelling forest soil respiration with in-situ microclimate measurements.

What was your motivation to be a part of FAIRNES COST action?

The idea of FAIR (Findable, Accessible, Interoperable and Reusable) shows the next advancement in the creation and management of large networks of data, but also in the way of thinking of current scientific society. As a young researcher, I wanted to be a part of this action as it is a valuable and important networking and career enhancing opportunity.

What are your expectation from FAIRNESS?

Most of micrometeorological studies are assessed on a local level. Here I think that creating FAIR data will bring more larger-scale studies, but also prolong the life of currently existing networks long after the suspected "project-length" lifetime. It might also help young researchers to promote their ideas, as they could access the data much easier. Last but not least, I could see this action as a one of first, with many other FAIR networks to follow.

What is your main benefit of summer school?

I have been working with microclimate data before, but mostly with already pre-processed data. As quality control of microclimate measurements are crucial for correct data analysis, I could see an opportunity to get new insights and learn how to enhance my research with using newest quality control and gap-filling techniques. Also, the analysis of urban heat islands might have an application in the analysis of microclimate in the forest areas after large-scale disturbances. Furthermore, the lectures from top-experts gave me the possibility to get on the track with the newest advancements in different aspects of micrometeorological research.

How do you see opportunities in your field of sciences?

To have a FAIR database means, that I can have an access to high quality data without spending days by looking for other networks, asking the data owners and harmonizing the datasets. In the end, I think such networks help to create more open world of science. For forest sciences, climate data are hardly available. To have FAIR data from other countries and different conditions means new opportunities in forest research.

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Between two issues

From August 28th to September 1st 2023, 11th International Conference on Urban Climate was held in Sydney, Australia. The conference gathers together scholars, planners and policymakers around the world. The **FAIRNESS project** and **Fair Micromet Platform (FMP)** was successfully presented to all delegates. More information could be founded on conference official website: <https://icuc11.com/>.

On August 29-30 2023, a two day group meeting (WG1 and WG2) and workshop was held in Brussels, Belgium. Workshop was devoted to gap filling and work was organized through four sessions. More information is available on: <https://www.fairness-ca20108.eu/workshops/>.



FAIR Network of micrometeorological measurements

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- **Areas of Expertise Relevant for the Action**
- Earth and related Environmental sciences: Meteorology, atmospheric physics and dynamics
- Earth and related Environmental sciences: Climatology and climate change

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Keywords

rural micrometeorology, urban micrometeorology, climate change, measurement network, knowledge share platform