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Editorial

Dear members of the International Society of Biometeorology,

This issue is focused on the announcement of the 19th International Congress on Biometeorology which will be held in December 2011 in Auckland, New Zealand. The report of an International Conference in 2010 is part of this bulletin. For the International Journal of Biometeorology we have a new responsible person at Springer and is here introduced.

Main target in this issue of the Bulletin is the report of climate change talks in Bonn, Germany in May and June 2010.

Andreas Matzarakis, Freiburg, July 2010

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News

19th International Congress of Biometeorology (ICB2011)

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The International Society of Biometeorology is pleased to announce that its 19th International Congress of Biometeorology (ICB2011) will be held in December 2011 at The University of Auckland, Auckland, New Zealand. The Congress theme will be Climate and Society.

The overall aim of ICB2011 is to explore the links between climate and society. This is because a central ethos of the interdisciplinary science of Biometeorology is the desire to understand interactions between atmospheric processes and living organisms - plants, animals and humans. Such interactions are fundamental to the well-being and sustainability of society at a range of geographical and time scales. Given this we anticipate the participation of scientists including social scientists and health scientists from a wide range of fields in ICB2011.

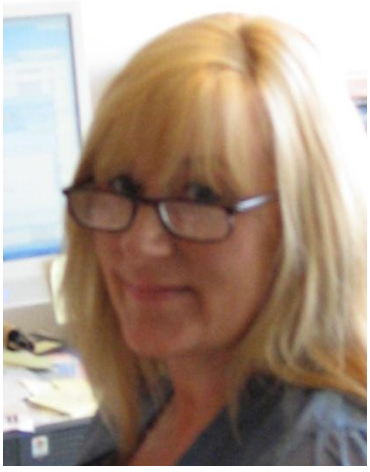
www.icb2011.com

From the Journal

A few words from the Publisher: Margaret Deignan at Springer SBM

As many Society members may be aware my esteemed colleague, Dieter Ceschlik, will soon be taking early retirement from Springer and thus from his involvement in the *International Journal of Biometeorology.*

In light of this development it was decided to move the publishing responsibility for the journal to the Environmental Sciences Unit at the Dordrecht office in The Netherlands. As Publisher for the recently launched book series*, Biometeorology,* I am delighted that the journal will be included in my publishing portfolio and look forward to working closely with the Society to ensure its continued success.



I have worked for almost 18 years within publishing, starting my career at a small printing company in my hometown of Liverpool, England. Relocating to The Netherlands gave me the opportunity to work in the academic publishing community, beginning with Kluwer Academic Publishers and later moving to the then newly formed Springer SBM (Springer Business Media).

My future development plans for the *International Journal of Biometeorology* are to continue to maintain and grow the journal by attracting quality contributions; to further increase the journal's profile and to assist in setting the foundations for a growing Impact Factor trend. Member input and support for the journal will continue to be crucial to ensuring its success and I look forward to working together with the Society and its members to help me achieve these common goals.

Best wishes.

Margaret Deignan
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UN Summit Report

Bonn Climate Change Talks
31 May to 11 June 2010

Tanja Cegnar, Slovenia

The Bonn Climate Change Talks took place from 31 May to 11 June 2010 in Bonn, Germany.
The meeting included:

- 32nd sessions of the SBSTA and SBI from 31 May to 9 June
- 12th session of AWG-KP from 31 May to 11 June
- 10th session of AWG-LCA
- several side events

Participants

In Bonn 4328 total participants were registered, 1904 of them representing parties and observer states coming from 183 parties and 2 observer states. 105 participants represented UN secretariat units and bodies, 47 special agencies and related organisations; among them UNDP and UNEP with 20 participants each, WMO with 2 delegates, WHO and ILO with one delegate each, World Balk with 5, IPCC with 11, FAO with 6 delegates. 175 intergovernmental organisations and 2097 non-governmental organisations (among them also ISB) were also participating. There were also 194 media participants.

Meetings venue: Holel Maritim

There were some parties sending only one delegate, but most of the parties had several participants enabling them to follow several ad hoc meetings, negotiations, consultations and side events beside the main sessions. Just a few examples of delegations size: USA delegation counted 43 participants, Tuvalu has sent 5 delegates, Russian Federation 18, Peru 5, New Zealand 16, Egypt 16, China 40, Canada 31, Australia 27, Austria 13. Numerous was also the delegation of Mexico as this country is going to host the COP 16 in Cancun in December 2010.

The main scope of the conference in Bonn was to **prepare material for the COP 16** to be held in Cancún, Mexico. A special desk operated during the meeting where it was possible to rent space, accommodation and obtain visas for the COP16/CMP 6.

Security measures

The Hotel Maritim is traditionally the venue of the SBI and SBSTA sessions in Bonn. There were quite severe security measures in place during the whole meeting. A fence surrounded the hotel during the meeting and at the entrance; there was a security check, as we know it from the airports. Everybody entering the hotel had to pass the security check. Those who had attended the previous sessions were already familiar with the procedure.

Admittance to the conference premises was possible only with a valid badge with a photo and bar code, enabling the organisers to keep control over the number of participants in the conference part of the hotel.

In front of the hotel there was a group of activists promoting vegetarian food staying there for both weeks. They were trying to convince delegates to endorse the promotion of vegetarian food, because evidence shows that meat production is an important source of GHGs and consuming only vegetarian/vegan food helps to reduce GHGs emissions. Beside this group a small group of demonstrates came in front of the hotel twice. As the hotel was surrounded by several police cars and a fence, all the demonstrations had to be announced in advance; demonstrations did not attract much attention among delegates.

Queue in front of the security check

As the hotel cannot accommodate all the participants, many of us were commuting from downtown Bonn.

Side events

Several side events that took place every day were an occasion to present and discuss on the base of more data and examples. Most of the side events were scheduled in such a way that they lasted 90 minutes, the first set taking place during lunch, the second and the third set in the evening after the sessions.

Focus on deforestation and forest degradation

On 8 June Adaptation day, one of the most relevant side events, took place in premises of the Gustav-Stresemann Institute at the walking distance form the Hotel Maritim. The event focused on sharing knowledge and experiences on adaptation in the areas of science-policy interaction, ecosystem-based adaptation, and the Nairobi Work Programme. Innovative adaptation research, policies and actions were show-cased, and the ways to improve access to relevant knowledge for informing adaptation were discussed.

Water is one of the key issues

It was difficult to choose among numerous side events taking place contemporary in the neighbouring ministerial buildings. Let's mention just some of them. Climate manipulation and new technologies pointed out that geo-engineering technologies have emerged as a new and potentially dangerous response to climate change. Organisers provided a critical overview of new technologies, the interests behind them and why they should be opposed or at least why the public should carefully monitor their development.

Sustainable development of cities is a challenge

Climate change and biodiversity synergies side event highlighted relevant recommendations from CBD SBSTTA-14 and presented the LifeWeb Initiative, which strengthens financing of natural solutions to climate change.

REDD+ partnership side event highlighted Japan Earth simulator and recommendations from the Oslo conference.

Among the various approaches how to mitigate climate change there was also the event about the need for inner change and individual perception of the nature as well as

Women play an important role in adaptation

by meditation. However, this event was not overcrowded as most of the other side events, obviously the topic did not fit into the delegates attitude.

Mexican delegates were very active not only during negotiations, but also at side events

Adaptation day

Adaptation day, organised by UNEP, World Bank and UNFCCC on 8 June 2010. Welcome address was delivered by Kaveh Zahedi, UNEP Climate change coordinator. He pointed out that adaptation is going on for a couple of years now and it is important to share examples of good practice. Also Mama Konate, Chair of SBSTA, highlighted research dialog under SBSTA as a very important tool to bring knowledge to the parties which should have access to the latest update on climate change. William Kojo Agyemang-Bonsu, Government of Ghana, concentrated on the relationship between international and national level. How to integrate adaptation in development? What factors are influencing efficiency?

Indigenous people presented their interests at several side events

Disaster prevention is an important part, but also financial aspects. There are significant additional costs for adapting infrastructure.

According to him knowledge is necessary at the national level, it is necessary to assess present and future impacts. It took 8 years that UNFCCC mentioned adaptation, 5 more to reach the agreement of adaptation fund.

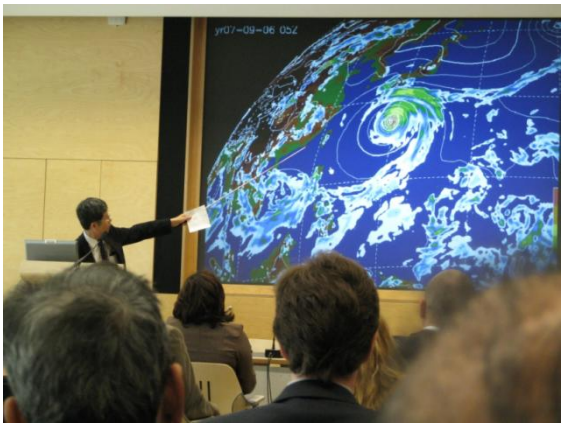
Opening address at the Adaptation day

There were the following sessions:

- Providing adaptation science for development policy and planning
- Ecosystem based adaptation: Knowledge to action
- Nairobi Work Programme the way forward

Not going into all the presentations, the most important issues addressed at the adaptation event were the following:

Jason Jabbour**,** UNEP Integrating climate change adaptation and mitigation in development planning, talked about the science policy interface and the critical role of knowledge intermediates. There is deficit of knowledge tailored to specific adaptation needs. It is necessary to strengthen science-policy interaction.



Earth simulator is a powerful tool not only for global but also for regional climate projections

A priority must be set on mainstreaming adaptation. Communication and dissemination of science is inadequate. We have divided scientists – policymakers, but there is a lot in between. There should not be only one-way information flow. One way to overcome the gap is to hold national science-policy dialogues organised to improve the information flow. Scale mismatch between policy requirements and research represents an obstacle for adaptation. Media are bringing information to most of the people in countries – especially in developing countries. Adaptation is already taking place, but it is not coordinated, it is fragmented. Local community wants ownership over solutions. His message was that more effective science-policy interaction is needed.

Knowledge intermediaries need to play a strong role in bridging the divide between science and policy.

Hiroki Kondo presented the amazing results obtained with the Earth simulator with 20 km super-high resolution global atmospheric modelling and regional modelling adopting time slice method. Average diurnal change can be well simulated (precipitation intensity – one of the outputs). Now they work on a long time climate projection, near time projection and extreme events projections. Outputs are applied to adaptation studies in many projects in different parts of the world.

Saleemul Huq – IIED was of opinion that adaptation science is still at the beginning. Adaptation occupied in the 3rd IPCC report only one chapter, in 4th assessment two chapters. Most of the text and attention is on mitigation. Also at Climate talks in Bonn a focus was on mitigation.

Adaptation is about doing things it is not any more analysis; doing and learning from doing. Scientists cannot tell to politicians what to do.

They need to work together. Adaptation is a process of co-learning. Experience tell us much more what not to do than what to do. The poorest countries are ahead in adaptation before developed countries. Scientists have to co-operate with policy-makers and practitioners.

Significant attention was dedicated to ecosystem based adaptation, several cases of ongoing adaptation were presented. Participatory processes are crucial for success of projects. Media and communication are also important. Under the Nairobi Work Programme the way forward session 2 objectives were identified: enhanced assessment and enhance decision making.

Knowledge also comes from practitioners not only from the universities. Open questions are:

Do we have the right information? Extreme events and slow on setting events are distinguished. Different institutions and finance are involved. Loses and damage?

What is a natural variability and what a climate change? We are lacking this information. What are the limits to adaptation? Indigenous knowledge is based on historical situation. Modelling is important, but we can not reduce uncertainty, because models are not good enough to provide answers to all the questions. We need a paradigm shift.

During the discussion several reasons were listed why NWP is seen as successful:

it is focused on adaptation to climate change, but also economic diversification is addressed. It is operated within the limits of SBSTA, and is not targeted towards implementation. Apart this no huge money is involved in NWP. Finally, it could engage a wide range of organisations to support the goals of NWP. A catalytic role of the UNFCCC is emphasized in NWP.

However, there are also evident gaps: dissemination is more than preparing templates, reports and translating. Adaptation is an issue for all people. We need to communicate it to all different groups and sectors. Adaptation actions should be country driven. Communication to stakeholders is crucial. We all agree that adaptation is needed. We need to identify potential and real barriers to starting adaptation actions on the ground; how to overcome existing barriers.

Exchange of information and knowledge is a keys issue. Resilience is beyond climate change. The NWP continuation shall be supported and it is necessary to bring science into real live.

Negotiations

Indigenous people were well represented and everyone could notice that they were very proactive. Especially when agriculture and forest management was addressed, they clearly expressed their points of view defending their rights. Eco-agriculture was one of the points that was strongly promoted as sustainable way of agriculture. One could easily agree with them, but in the developed world eco-agriculture has a limited potential and one is questioning himself if it is really the way out, as we know that the world population is still to increase.

During the negotiations there was a net polarity. Mainly developed countries sticked with the Copenhagen Accord and insisted on pledges, while most of the other countries wanted to set an obligatory decrease of GHGs emissions in order to achieve the below 2 °C target agreed by all the parties. Many delegates expressed the fear that with

pledges the temperature would rise up to 3 or even 4 °C, and that is clearly unacceptable.

Vegetarians presented their point

Also LULUCF was a hot topic. Carbon sinks are an opportunity for not real decrease of emissions and there is a need for further definitions and monitoring of deforestation, degradation and reforestation actions. A lot of science behind this rules development could be an excellent opportunity for our colleagues dealing with forestry to contribute to the process.

One of the very import topics was the sustainable development of cities, as more than one-half of the population lives in cities and the share is constantly increasing. Sustainable development of cities was a topic

In the corridor

of one of the side events. Closely related to cities development is sustainable transport development. Until now, transport remains one of the most difficult sectors for mitigation actions.

Demonstrations to convince parties to reduce GHG emissions

Session on science development under the SBSTA umbrella

There was also a special session under the SBSTA umbrella on science development and future research needs. It was less populated than the other SBSTA or SBI sessions. Although the most prominent science representatives were delivering their reports, the science was quite compressed and summarized in order to allow delegates to understand the message. The session was structured in 3 parts. The first one was on the present state of science and the most important ongoing processes influencing climate change. Ozone hole was mentioned as an example of successful story giving a proof that coordinated action and appropriate measures are effective. The ozone hole will still appear during the next decades, but the annual variations are due to varying climatic conditions and the ozone hole will slowly disappear. Much of the attention was dedicated to the acidification of the ocean. The process can potentially lead to unforeseen impacts on the food chain, but

right now the effects are still to be investigated.

The second part concentrated on the regional level. The performance of models is improving and therefore the ability to produce regional outlooks. The seasonal outlooks have to make significant progress in future also in extra tropical regions. Therefore significant efforts are made to understand and capture the natural variability of climate like ENSO, NAO and others. Downscaling remains and important tool to develop results on the regional and local scale.

IPCC explained the future plane of work and procedure to produce the 5th report in 2014. In addition, some of the dilemmas opened last year were addressed. It was also pointed out that a lot of the existing knowledge is not published in PR publications and therefore not included into the IPCC process. Nevertheless, IPCC remains the authoritative scientific voice regarding climate change and a base for the negotiation decisions under the umbrella of the UNFCCC.

It was clearly pointed out that climate change is much more than global warming, but all the negotiations are concentrated around below 2 °C target, not explicitly mentioning the GHGs concentration. Maybe this approach facilitates the negotiations, but we should be aware of changes in natural climatic variability, ecosystems, precipitation, frequency and intensity of extreme weather events and slowly on setting climatic phenomena like drought.

There was a clear claim for more local projections as adaptation happens mostly on the local scale. In addition, a need for tools how to address and deal with uncertainties and how to adequately perform risk management was expressed by many delegates.

Participants were unanimous in assessment that there is still a gap between scientific and political communities. More attention should be dedicated to the communication issues. Participants agreed that there is a need for improving communication skills of scientists and establishing a more comprehensive and fruitful dialogue between scientist and policy makers.

Special sessions

On 9 June 2010 a joint session of the SBI and SBSTA took place to bid farewell to Mr Yvo de Boer, Executive Secretary of the UNFCCC. Christiana Figueres from Costa Rica was appointed as the next Executive Secretary.

Groups other than the Convention and Protocol bodies held several closed meetings which were not opened for NGO. As these groups play paramount role in negotiations at least the most important should be mentioned: African group, Alliance of Small Island States, Environmental Integrity group, Group 77 and China, Least developed countries, Coalition for Rainforest Nations. Also observers organisations had their closed meetings, among them were: Youth non-governmental organisations, Business and industry NGO, Women and gender NGO, Indigenous peoples organisations, Farmers NGO, Organisation of the petroleum exporting countries/Organisation of Arab Petroleum exporting countries, Association of Southwest Asian Nations.

Each day several Press conferences took place; they were organised for the media only.

Bonn meeting conclusions

One of the key issues under the Subsidiary Bodies was an agenda item under SBSTA on scientific, technical and socio-economic aspects of mitigating climate change. The Alliance of Small Island States, with most

other parties, called for requesting a technical paper by the Secretariat on options for limiting global average temperature increase to 1.5 °C and 2 °C from pre-industrial levels. The proposal was opposed by Saudi Arabia, Oman, Kuwait and Qatar. No agreement was reached and parties eventually adopted SBSTA conclusions without referencing the technical paper. Many parties and civil society representatives expressed "deep disappointment" at the outcome.

SBI session

The AWG-LCA focused on exchanging views on the Chair's new draft negotiating text (FCCC/AWGLCA/2010/6) through a contact group chaired by AWG-LCA Chair Margaret Mukahanana-Sangarwe (Zimbabwe). During the meeting, several delegates commented on the constructive mood and some felt that progress was made on issues, such as finance. However, AWG-LCA 10 did not adopt conclusions as parties did not reach agreement on issues including a request to the Secretariat to compile developed and developing countries' mitigation pledges. Late in the evening on Thursday, 10 June, AWG-LCA Chair Mukahanana-Sangarwe circulated the advance draft of a revised text to facilitate negotiations among parties, to be issued as an official document (FCCC/AWGLCA/2010/8) for consideration by AWG-LCA 11 in August. She explained that the draft text would still be revised before the August session and that she did not wish to discuss it at AWG-LCA 10. During the closing plenary, a number of developing countries indicated that the advance draft was "unbalanced," emphasizing that it could not be used as the basis for negotiations in August unless developing countries' proposals were better reflected.

For the AWG-KP, the focus was on Annex I emission reductions and other issues, including the flexibility mechanisms and land-use, land-use change and forestry (LULUCF). In particular, parties exchanged views on the pledged emission reductions and the underlying assumptions on the use of the flexibility mechanisms and LULUCF in the post-2012 period. They also addressed legal matters and ways to ensure that there is no gap between the first and subsequent commitment periods. Late on Friday night, 11 June, the AWG-KP agreed to conclusions (FCCC/KP/AWG/2010/L.4) requesting the Secretariat to prepare a technical paper on legal issues and organise a technical workshop on the scale of Annex I emission reductions before AWG-LCA 13. Many felt that even though the level of ambition reflected in Annex I parties' pledges remains inadequate, the AWG-KP has now made some "progress in the right direction."

SBSTA session

Prospects for Cancún

The Bonn session highlighted the challenges faced by delegates on the way to Cancún, including how ambitious they should be. On the AWG-LCA side there was some uncertainty about the next steps. Future mostly depends upon the final version of the revised draft negotiating text released before the meeting in August. The path through Cancún and beyond requires political decisions from the top that will allow us to operationalize the discussions held during the last two and half years. There was the impression that the Secretariat and the Mexican hosts of COP 16 are also trying to manage expectations for Cancún: while some still call for a legally binding agreement in Cancún, others are now saying "it is unlikely," and were speculating on outcomes ranging from a variety of work programmes emerging from the Subsidiary Bodies, or agreement on issues under the AWGs on which there was substantial consensus in Copenhagen (such as REDD+ and finance) or on an broader architectural framework. However, it is also likely that some parties will not allow advanced individual issues, such as REDD+, adaptation and finance, to proceed independently of a larger political package and has asked parties considering the prospects for a comprehensive legally binding agreement in South Africa at COP 17 in 2011. After Copenhagen the awareness of the challenges involved in reaching an ambitious agreement increased. The impacts of climate change become increasingly apparent, it is clear that stringent action is required now more than ever before, in order not to close the door to the 1.5 °C, or even 2 °C, world. Failure is therefore not an option. Listening to the climatologists, they are sceptical about keeping the temperature rise below 2 °C, all the observed present trends indicate that a larger increase is more likely.

Next meeting

The Sixteenth Conference of the Parties to the UNFCCC and Sixth Meeting of the Parties to the Kyoto Protocol, the 33rd meetings of the SBI and SBSTA, as well as AWG-LCA 13 and AWG-KP 15 will take place from 29 November to 10 December 2010 in Cancún, Mexico.

Recommendations to the ISB EB

As the issues under the UNFCCC are highly relevant for the ISB, I recommend that the ISB EB will continue to follow the outcomes of the negotiations and related development. Especially the adaptation part of the process is closely related to the ISB field of interest, but there is also potential to contribute to the development of the mitigation measures in some sectors (e.g. sustainable farming, forestry, urban climatology).

Recommendation to the ISB EB is to assign one member to follow the UNFCCC activities and regularly brief the membership via our bulletin or on the web page about the up to date activities.

As the UNFCCC meetings are frequent and compared to the other scientific conferences quite long, I would suggest that we develop clear rules how much time and resources shall we dedicate to the UNFCCC activities. Of course, it would be to demanding to follow all the meetings. We should discuss this in the frame of the ISB EB.

ACRONIMS related to the UNFCCC

AWG-KP - *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol

AWG-LCA - *Ad Hoc* Working Group on Long-term Cooperative Action under the Convention

COP - Conference of the Parties

GHG - Greenhouse gas

IPCC - Intergovernmental Panel on Climate Change

LULUCF - Land use, land-use change and forestry

REDD - Reducing emissions from deforestation in developing countries

REDD+ Reducing emissions from deforestation in developing countries, including conservation

SBI - UNFCCC Subsidiary Body on Implementation

SBSTA - UNFCCC Subsidiary Body on Scientific and Technical Advice

UNFCCC - United Nations Framework Convention on Climate Change

Thanks to the support from the Tromp Travel Fund, I was able to attend the SBI in SBSTA meeting as representative of the International Society of Biometeorology.

Conference Report

Report on the 7th BIOMET Conference held at Freiburg (12 – 14 April 2010)

by Wilhelm Kuttler, Essen, Germany

The Expert Committee Biometeorology (FA BIOMET) of the German Meteorological Society (DMG) held its 7th conference from the 12th to 14th of April 2010 at the Albert-Ludwigs-University of Freiburg. In contrast to the previous meetings of the Expert Committee, this time the organizers of the conference, Andreas Matzarakis, Helmut Mayer and Frank-Michael Chmielewski, enlarged the range of participants to include experts from abroad. Hence, 94 experts from Germany and abroad gathered for a three day exchange of information in cool weather conditions with a maximum PET (Physiologically Equivalent Temperature) of 11.5 °C recorded at the Freiburg weather station.

The scientific programme was divided into the following sessions: human biometeorology, urban bioclimate, climate and tourism, agricultural and forest meteorology, animal biometeorology, climate change and biometeorology, and phenology.

Human biometeorology

There are several ways available to define the thresholds needed for determining the heat load on a human body, for example the 95 percent percentile of the daily maximum and minimum temperatures, a regression relation between temperature and mortality or the more exact thermal indices. The *perceived temperature (*pt), for example, was shown to be a well suited measure of thermal load (Gabriel, Berlin/DE). On the basis of this index, statements were made about the future development in Germany, which beyond the expected general increase in the thermal comfort range also project a relatively wide geographic disparity between the coast (where the values are expected to be higher) and southern Germany (Thiele-Eich et al., Bonn/DE).

The presentation of the *Universal Thermal Climate Index* (UTCI) made it clear that this thermal index, which can be applied everywhere in the world, is being increasingly used in human-biometeorological applications (Jendritzky et al., Freiburg/DE). Along with the

Windchill Index (WCI), the UTCI index was used to provide comfort estimates for cold spells during the winter in Bulgaria (where the UTCI will supersede the WCI in such studies in the future) (Gospodinov, Sofia/BG). Various interurban comparisons were carried out between Budapest, Paris, Warsaw and Rome using the UTCI index (Idzikowska, Warsaw/PL). Accurate determination of radiation temperature continues to be an important input requirement for thermal indices. Due to the fact that radiation temperature as well as short-wave surface albedo are mainly determined by incoming and outgoing long-wave radiation fluxes and that the latter are measured too seldom, algorithms are needed to make indirect determination of these values possible. In this context, Staiger and Matzarakis (Freiburg/DE) presented improved methods.

With a view to obtaining area-related (instead of point-related) statements on the thermal conditions of a moving human who comes across different microclimates, it was suggested to apply a Lagrange model using meteorological and physiological input parameters (pulse beat, thermal sensation, etc.) received by means of portable measurement devices (Nakayoshi and Kanda, Tokyo/JP). It continues to be difficult to prove any connection positive between certain diseases and meteorological conditions. However, the effects of air temperature on pneumological diseases were successfully shown for Bavaria and other areas with differences found between men and women (Wanka et al., Munich/DE). Statistically, a connection between hypertension and meteorological conditions was best found by means of the perceived temperature (pt) (Koppe et al., Freiburg/DE). An increased number of emergency admissions to hospitals, due to cardiovascular diseases, was recorded in Vilnius/LT during the winter with air temperatures below 0 °C and air pressures above 1010 hPa (Liukaityte, Vilnius/LT).

Mortality continues to be the preferred, most reliable indicator for human biometeorological studies referred to weather conditions and their impacts on the human body.

Another study shows that during summer, the mean mortality rate in Vienna has increased along with increasing PET values, whereas during longer heat waves, adaptation processes with low mortality rates started to set in, apparently without causing any 'harvesting effect' (Muthers and Matzarakis, Freiburg/DE).

Mostly, mortality and weather impacts are brought into relation with one another at a large scale. However, there is also a keen interest on analyses with a higher spatial resolution, such as those carried out at quarter level for the city of Lisbon to analyse the heat wave effects at a local level (Canario and Andrade, Lisbon/PT).

Sudden, foehn-caused temperature rises may lead to an increase in respiratory diseases, followed by an increase in the number of hospitalisations. An example for this is the Saharan dust event (southerly wind) on the island of Crete, during which the number of admissions to the hospital of Heraklion on the northern coast of Crete in the lee of the Creatian mountains was threefold the number of hospitalisations recorded on days without Saharan dust (Nastos et al., Athens/GR).

About 15 million people are reported to suffer from allergies in Germany. The criteria are pollen start date, length of season and concentration of pollen. The analyses published over the past few years by the Pollen Information Service (Deutscher

Polleninformationsdienst, PID) on the basis of the data provided by the DWD's PID reference station show that the concentrations of pollen have increased, especially those of grass and birch (Kaminsky and Glod, Freiburg/DE). Similar findings were reported from the Korean pollen monitoring network, where it was also proved that allergenic concentrations of ragweed (Amb a 1, ambrosia) increases with CO_2 concentrations in the atmosphere. Furthermore, it was found that allergenic pollen is five times more frequent in urban air than in rural air (Choi et al., Seoul/KR). However, another finding is that the presence of allergens in the air does not depend on pollen alone (Buters et al., Munich/DE).

Urban bioclimate

Urban green spaces play an important role in the improvement of the (urban) microclimate. Among the others studies were carried out, to analyse the reduction of radiation temperatures due to trees in urban areas (Meier et al., Berlin/DE) and to examine the influence of urban green spaces on air temperatures in urban canyons (Heusinkveld et al., Wageningen/NL). Climate-improving effects of green spaces in urban areas were also found to exist in the towns and cities in hot and dry regions (Beer Sheva/IL). In this context, both shadowing effects and evapotranspiration (which was up to 18 l per tree and hour in June, providing there was sufficient water supply) played a role (Shashua-Bar et al., Beer Sheva/IL). PET values, as opposed to air temperatures, are a much better way of identifying climate-specific heat load reduction due to the presence of trees (Potchter et al., Tel Aviv/IL). Further single case studies show that PET values do not only depend on the type of location, urban or countryside (Gulyas et al., Szeged/HU), but also on small-scale and street-canyon affecting factors, such as the Sky View Factor (SVF) and roadside green spaces (Holst and Mayer, Freiburg/DE). Matzarakis and Matuschek (Freiburg (Brsg.)/DE) presented several simple ways to determine SVF. Each thermal load study should also take account of the individual thermal sensation and compare it with index values (e.g. PET) by means of interviews (Katzschner et al., Kassel/DE). For estimating the basic thermal conditions of bioclimate, the UTCI index is of great use. In Poland, for example, such comparisons were carried out for selected towns and cities (Bakowska, Warsaw/PL). In the field of modelling, efforts are undertaken to improve the models by including not only meteorological parameters and structural information on towns and cities, but also input parameters, such as the type of roadside green (Dai, Hong Kong/CN). At the same time, however, it was also stressed that both measurements and model computations for thermal comfort purposes require the utmost accuracy (Matzarakis, Freiburg/DE). This also applies to the software especially designed for planning tasks and tested on the climate analysis for Seoul (Yi et al., Seoul/KR). To address climate change it is necessary to investigate not only already extensively studied thermal effects, but also any future change in gaseous and particulate air pollution, in particular air pollution due to ozone and fine particles, as ozone concentrations will increase (Kuttler, Essen/DE). In the end, only interdisplicinary projects including both planning aspects and society-changing measures in their considerations will provide the results needed to assess the effects of climate change on urban areas (Schneider et al., Aachen/DE). Compared with the impacts of thermal conditions, the more serious problem to be solved in emerging countries (here: African

countries and Turkey) is that of gaseous and particulate air pollution, according to the studies on Kigali/RW (Henninger, Kaiserslautern/DE) and Erzurum/TR (Yilmaz et al., Erzurum/TR).

Climate and tourism

This session focussed on finding out the scale of climate change will impact on tourism. Several facts should be taken into account in this context, for example, the increasing number of days with elevated heat loads in health resorts, which has been currently observed and is expected to increase even further (Bläsing, Freiburg/DE). Furthermore, the geographic distribution of summer tourist areas is expected to change, as shown through the examples of the Pannonian Basin (Zaninovic et al., Zagreb/HR), eastern Anatolia (Yilmaz et al., Erzurum/TR) and the Lake Balaton area (Nemeth and Matzarakis, Szeged/HU and Freiburg/DE). Several studies were carried out to examine climate change in Germany (Endler and Matzarakis, Freiburg/DE), Portugal (Machete et al., Lisbon/PT), Australia and New Zealand (Freitas, Auckland/NZ, and Matzarakis, Freiburg/DE). The example of the Tyrol illustrates the impact of climate change on winter tourism: according to the study, close to 30 % of the skiing areas will have to be abandoned by 2100 (Steiger, Innsbruck/AT). In 2011, Erzurum in Turkey will host the World University Games (UNIVERSIADE). For this reason, calculations of thermal comfort during the winter were carried out for this winter sports centre (which is situated at 1,800 m a.s.l.) using PET (Yilmaz et al., Erzurum/TR). Another study relying on PET analyses proved the positive effects of sea breeze on the thermal conditions in the coastal region of Madeira. The records show that 87 % of the days (May to September) were characterised by cooling sea winds (Lopes et al., Lisbon/PT). Human beings following a change in location confronted with completely different climate conditions, usually face with acclimatisation problems. Such acclimatisation problems can be described by means of the *Acclimatization Thermal Strain Index* (ATSI), which is the ratio of the respiratory heat loss at a person's home location to the respiratory heat loss at his/her destination. An example of this is the case study carried out on Russian citizens from Khabarovsk (Amur) with continental climate conditions, who went on holiday to Haikou on the island of Hainan/CN with tropical monsoon climate. In their case, the ATSI index reached maximum values of +42 % and -74 % (Freitas and Grigorieva, Auckland/NZ).

Agricultural and forest meteorology; animal meteorology

The most reliable way to obtain evidential statements on the impact of climate change on agricultural crops in Central Europe currently is to process ensemble computations from the various available models in the German agrometeorological advisory system AMBER. Löpmeier and Frühauf (Braunschweig/DE) presented their results in this context and discussed the problem that agrometeorological models require a higher temporal resolution than being so for provided by the mentioned models. As most climate models project an increase of the number of summer droughts in Germany drought indicators such as the standardized precipitation index, the vegetation stress index and the grass curing index should be made available for routine monitoring tasks (Wittich and Becker, Braunschweig and Lindenberg/DE). Checking the sensitivity of agrometeorological models to changes in the meteorological boundary conditions is of vital importance for the

reliability of the statements, as has been proved by Braden (Braunschweig/DE) by means of several model runs in AMBETI/BEKLIMA. Here, specialised advisory services (such as those provided by the DWD in the fields of irrigation, yield and quality of cultivated pasture, cutting dates, etc.) are steadily gaining an importance (Weßnigk and Fildebrandt, Braunschweig/DE). This is even more important against the backdrop of an increasing number of late frost damages, for example to apple trees as a result of their advanced flowering due to the warmer climate in Germany (Chmielewski et al., Berlin/DE). Furthermore, some consideration is currently being given to the question of how adaptation measures can be implemented on arable land where the natural water resources are limited. Thomas et al. (Vienna/AT) showed on the example of 'Austria's granary', i.e. Marchfeld in eastern Austria for the climate change between 1966 and 2005, that wind break hedges help to improve water use efficiency as a result of reduced evapotranspiration.

There are clear signs that sweet component concentrations in the sugar plant (Stevia rebaudiana), which will shortly be allowed in Germany, correlate positively with the temperature. This crucial finding results from a study undertaken by Kumar et al. (Palampur and Bhopal/IN) for growing areas in the western parts of the Himalayas. On the basis of growing-degree days and a high degree of geographic differentiation, Grigorieva (Birobidzhan/RU) and Matzarakis (Freiburg/DE) evidence for climate changes in the growing areas of the Russian Far East.

So far, indices that are used to determine the heat load on agricultural animals, for example with the aim to discover any correlation between meteorological conditions and milk production from dairy cattle, have provided statistically reliable statements on a monthly basis only. The major objective, though, is to provide models of higher temporal (e.g. daily) resolution. Gaugham and Lees (Queensland/AU) are currently working on the development of such a model.

Forest areas react differently to the range of solar radiation factors (blue-red and red-infrared ratios) depending on their type and structure and on the amount of cloud cover. In this context, Hertel and Leuchner (München/DE) showed that lower sun elevation causes the B/R ratio to be higher (growth is enhanced) whereas the R/IR ratio (which affects the phytochrome system) increases with increasing cloud coverage and canopy shadowing.

Climate change issues

Apart from the long-term air temperature series, climate changes can also be documented on the basis of long-term measurement series of other meteorological parameters. For example, the analysis of the 25-year data series recorded at 11 radiation stations in the Czech Republic shows that the global radiation flux density has significantly increased both in the lowlands (strong increase) and in the mountain areas (less strong increase) (Nekovar and Bagar, Prague/CZ). Due to the fact that heat stress is mainly caused by high radiation temperatures and air humidity, its evaluation is usually based on thermal indices (e.g. PMV, PET, pt, UTCI). In some cases, however, data are used which have been recorded using the globe thermometer, as reported by Willett and Sherwood (Exeter/GB), who determined the summer temperatures and their distribution around the world using the "wet-bulb globe

thermometer" (WBGT) to enter the resulting data as input data in a statistical model (A1B scenario). The temporal and spatial development of thermal loads in Germany was determined by means of the Klima-Michel model which is driven by data from the REMO regional climate model. A comparison between data from the REMO verification run and actual observations brought evidence of a systematic model error resulting from overestimation of the dew point and which was eliminated by means of a correction function. Furthermore, Tinz et al. (Hamburg/DE) observed a significant increase in the heat load in Germany since the beginning of the 21st century. At the urban scale with Berlin as an example, corresponding results were obtained from the urban bioclimate model UBIKLIM, which is driven by the regional climate models REMO and WETTREG (Grätz, Freiburg/DE). Apart from the increasing heat load, Central Europe is also experiencing a higher frequency of infectious and non-infectious (allergies) as well as cardiovascular diseases (Mücke, Berlin/DE).

The way to examine the impact of climate change on the drinking water resources on atolls in the tropical Pacific was shown by Helbig et al. (Göttingen/DE) on the basis of sensitivity analyses.

Phenology

In order to optimise phenological models much more consideration will need to be given to plant-physiological parameters (e.g. water content), in addition to air temperature as one of the major variables controlling the growth of plants. Precise definition of the phenological phases is necessary for detecting changes relating to the beginning or end of the vegetation period (Braun and Müller, Geisenheim/DE). It was shown for specific, pre-defined periods (from the last temperature minimum in winter until the average warmest day) that during the past 40 years, the vegetation period in Germany has become longer (15 days on average) (Janssen, Offenbach/DE). Studies carried out on the basis of phenological models and for which data from regional climate models (CCLM) were used, show that an advancement of the bud burst dates is not expected before 2030 (Urhausen et al., Bonn/DE).

The oral presentations were supplemented by poster presentations, which also received a wide interest from the participants.

The 7th BIOMET Conference in Freiburg ended with many thanks to the hosts and the prospect of meeting again in three years time.

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The extended abstracts of the presentations held during the conference have been published in:

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http://www.mif.uni-freiburg.de/biomet/bm7

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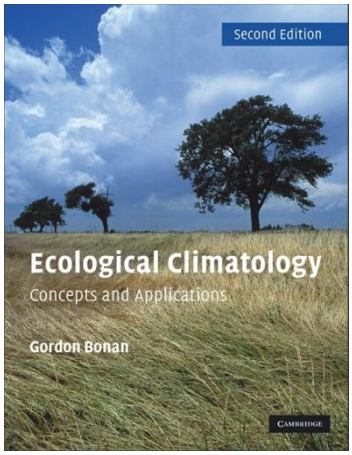
Picture 1:The participants of BIOMET 7 in the midday sun in front of the Albert-Ludwigs-University of Freiburg. Copyright: Helmut Mayer, Freiburg

Books

Ecological Climatology (2nd edition, 2008)

by Gordon Bonan

The book is written as an introductory textbook for graduate students and advanced undergraduates. It reviews the key scientific concepts, the field observations that support these concepts, and climate model applications that show the impact of vegetation on climate. To aid professors in lectures and to help students understand concepts, the book contains 409 illustrations, many in color.



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15th World Clean Air and Environmental Protection Congress

11-16 September, Vancouver, Canada.

http://www.iuappa2010.com

10th EMS Annual Meeting 8th European Conference on Applied Climatology (ECAC)

13 – 17 September 2010, Zürich, Switzerland
http://meetings.copernicus.org/ems2010/

Fourth Central and Eastern European Conference on Health and the Environment

10-13 October, Prague, Czech Republic.

www.ceeche.org

Indoor Air 2011

5-10 June, Austin, Texas, USA.

http://lifelong.engr.utexas.edu/2011

The International Conference 'Deltas in Times of Climate Change'

September 29 – October 1, 2010, Rotterdam, the Netherlands

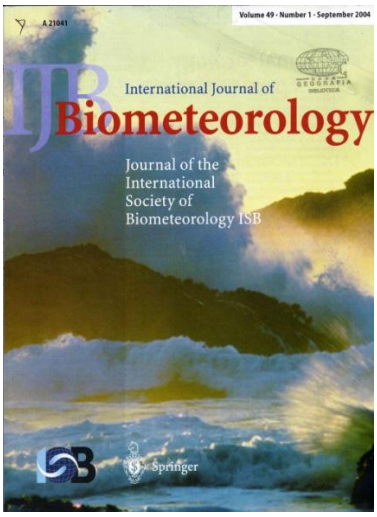
http://www.climatedeltaconference.org/nl/25222734-Home.html

Air Quality Eight

24-27 October, Arlington, Virginia, USA.

http://www.undeerc.org/AQ8

The Journal of the Society



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