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Contents

Compiled by Elena Grigorieva and Scott Sheridan

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Meeting on the Global Framework for Climate Services and the ISB; Rome, 22 to 25 October 2018

Pablo Fernández de Arróyabe

The International Forum of Meteorological Societies (IFMS) is an organization to foster and encourage communication and exchange of knowledge, ideas and resources among the world's meteorological societies.

ISB was invited last year to participate in the ninth meeting of the Partner Advisory Committee (PAC) of the Intergovernmental Board on Climate Services (IBCS-PAC) on 22-23 October 2018 and to the sixth meeting of the IBCS Management Committee (IBCS-MC6) on October 24-25. Both events took place at the FAO headquarter in Rome.

ISB was invited as an observer to attend both events. Prof. Pablo Fernandez de Arroyabe attended the events in representation of the Society. ISB has been invited to become a member of the PAC of the GFCS as other scientific societies have done it before such as the International Union of Geophysics and Geodesy (IUGG) which is already a member of the PAC. The participation of scientific societies in the PAC is related to the creation of links to a vast network of expertise and technical knowledge. In the case of the ISB, the joint climate/health Office with WHO provides an additional opportunity for the partnership.

Firstly, in the PAC meeting http://www.wmo.int/gfcs/9th-session-PAC a review of the implementation of the recommendations of previous meeting of the PAC was done attending to:

- mapping of the status of National Frameworks for Climate Services
- mapping the institutional resources available
- mapping of project proposal pipeline to enable cross-fertilization among partners
- presenting the EC call for proposal under Horizon 2020 in relation to Climate Services for Africa

A review of the status of the task forces and working groups stablished by the IBCS Management Committee was done and final recommendations of the PAC on the report on Governance, management and finances of the GFCS to the Management committee of the IBCD were given. A technical session focused on technical advances and developments in services delivery was also presented.

Secondly, in the sixth meeting of the IBCS Management Committee, different recommendations on Governance Structure http://www.wmo.int/gfcs/ibcs-mc-6 were proposed by the MC which can affect the role of the PAC in the GFCS.

In summary, it has been clarify that ISB would be eligible to join the PAC through a quite simple procedure that starts with an application form which is reviewed by the WMO Legal Counsel before endorsement by the Chair of the Intergovernmental Board on Climate Services. The interest of ISB in joining the GFCS-PAC is still open but it would be important to know first what role the PAC will be assigned in the GFCS in the next WMO meeting.

Past President Mark Schwartz honored at AMS and AAG

Past President Mark D. Schwartz was presented with the 2019 *Outstanding Achievement in Biometeorology Award* from the American Meteorological Society (AMS) at the award dinner during the AMS Annual meeting held in Phoenix, AZ (January 9, 2019). The award citation reads "For innovative advancements in phenological modeling and observations, and exceptional achievements in promoting knowledge and applications of phenology for the benefit of research and society". Schwartz has also been selected to be an Association of American Geographers (AAG) *Fellow*, as one of 13 members in

the 2019 class. This is the second year the AAG has bestowed these lifetime honors and brings to 33 the total number of Fellows recognized by the Society. Further, Schwartz will also be recognized by the AAG Climate Specialty Group, receiving this year's Lifetime Achievement Award. Both AAG honors will be given during the AAG Annual Meeting being held 3-7 April 2019 in Washington, D.C.

7th Pan Commonwealth Veterinary Conference (PCVC7) 3 to 7 March, 2019, Bangalore, India

Veerasamy Sejian

Many of the World's Leading Animal Biometeorologists under one roof at The ICAR-National Institute of Animal Nutrition and Physiology (ICAR-NIANP), Bangalore, India which hosted the 7th Pan Commonwealth Veterinary Conference (PCVC7) from 3rd to 7th March - 2019. The Conference titled "The Role of Veterinarians in Addressing the Global Challenges to the Lives of Our Pets, Livestock, Wildlife, Humans and Our Environment" was jointly organized by the Commonwealth Veterinary Association (CVA), ICAR-NIANP; Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU); Karnataka Veterinary Association (KVA) and Pet Practitioners Association of Karnataka.

The Pan Commonwealth Veterinary Conferences are organized by the CVA once in 4 years. Addressing the delegates Dr. Peter Thornber, President, CVA highlighted about the celebrations of 52nd Year by the CVA in extending its voluntary support and assistance for the veterinarians throughout the commonwealth at the grass-root level.

The delegates consisting of the members and councillors of CVA, invited speakers from India and abroad and, academicians, students and policy

makers from the different Indian institutions, organizations and associations participated in the conference.

The PCVC7 provided a perfect platform to the delegates to share, exchange and gather the current knowledge and future opportunities in the different fields of veterinary and allied sciences.

The conference registered a total participation by more than 700 delegates including 50 overseas delegates from 38 different countries.

Session II: Climate Change

The session comprised of 11 lead speakers and 27 poster presentations. This particular session widely covered animal biometeorology. With four Indians, five Australian, One Italian and one Nigerian covering all dimensions of climate change and livestock production, the session was the attractive package for the delegates purely due to the scientific program of this particular session. The topics covered were Climate change impact, Concept of multiple stresses, Climate change adaptation, Strategies to ameliorate heat stress and enteric methane emission and mitigation.

Sl. No.	Lead Speakers and the Title of the Paper
1	**Climate Resilient Livestock Production: An Indian Perspective** *Raghavendra Bhatta, ICAR-NIANP, India*
2	**Climate Change and Livestock Production: The Current Scenario and Ways Forward** *J.B. Gaughan, University of Queensland, Australia*
3	**Heat Stress Related Illnesses in Dairy Cows** *Nicola Lacetera, University of Tuscia, Italy*
4	**Challenges for Disease Surveillance and Biosecurity Practices Associated with Climate Change: Vector Borne Disease Case Studies in South-Eastern Australia** *Dianne Phillips, CVA, Australia*

5	**Impact of Climate Change on Sustainable Livestock Production and Existence of Wildlife Species in the South Pacific Island Countries: A Review** *Paul A. Iji, College of Agriculture, Fisheries and Forestry, Fiji*
6	**Climate Change and Livestock Production: Multiple Stresses Impact and Amelioration** *Veerasamy Sejian, ICAR_NIANP, India*
7	**Steps to Sustainable Livestock: Focus on Mitigation and Adaptation to Global Warming** *Graeme B. Martin, University of Western Australia, Australia*
8	**Nutritional Strategies to Ameliorate the Effects of Heat Stress in Livestock** *Frank R. Dunshea, University of Melbourne, Australia*
9	**Nutritional Strategies to Improve the Reproductive Performance of Sheep** *Michael A. Friend, Charles Stut University, Australia*
10	**Phytochemicals in Methane Amelioration and their Impact on the Rumen Microbes** *P.K. Malik, ICAR-NIANP, India*
11	**Temperature Humidity Index Based Automation for Thermal Stress Amelioration in Cattle** *Prasad A, Kerala Veterinary and Animal Sciences University, Kerala*

Recommendations emerged from the session include:

1. Multidisciplinary approaches are the best to manage the effects of climate change on livestock production. The key to success of sustaining livestock production includes: early planning, proactive management, the ability of the systems to change and adapt, along with policies favouring livestock adaptation.

2. Adaptation strategies ensuring both animal welfare and production are crucial to limit economic losses incurred as a result of climate change. This calls for consorted efforts to identify disease resistant breeds which can withstand the adverse climatic condition.

3. Under climate change scenario the rainfall and temperature variability are key factors for vector borne pathogen distribution; such variability has brought challenges for market access and biosecurity planning. The disease surveillance data, animal traceability and vector distribution models can be used as tool in early detection and prediction of disease.

4. Climate change has a huge ramification for the South Pacific Island Countries (SPIC). Hence there is urgent need for developing policies emphasising reduction of GHG emissions and to prevent mass migration to others countries and extinction of wildlife species in the SPIC.

5. Studies pertaining to sustaining livestock production in the changing climate scenario must target reducing the impact of multiple stresses rather than heat stress alone as in the extensive system of rearing apart from heat stress, nutrition stress (lack of pasture) and walking stresses (in search of limited pastures) occur simultaneously.

6. Reduction of methane foot print by novel forages, feed additives and genetics can help to reduce the impact of ruminant animals on climate change. Further, improving the physiological capacity through genetic selection to adapt to warmer climate can maximize productivity and improve ecosystem health, without affecting food production, thus ruminants can ensure food security by 2050.

7. Uses of feed additives like antioxidants, betaine and chromium or by altering the site or rate of starch fermentation are the most important, flexible and economical methods to alleviate heat stress. In particular, the nutritional interventions should be applicable around the time of mating

or during pregnancy or towards the close to parturition for obtaining better dividends for the intervention.

8. Phytochemicals are tremendous methane suppressants when provided at optimum levels. Research efforts are needed to identify more such physiochemicals in an effort to develop region as well as season specific methane mitigation strategies at low cost.

9. There is huge scope to use automated THI controller in reducing the adverse impacts of heat stress on livestock. Further, high producing dairy cattle reared intensively in tropical regions require scientifically combined effect of two or more different ameliorative methods to maintain a constant core body temperature in heat stressed animals.

Visit of core Climate Change Session Delegates to Historical Mysore Palace

Cool Cities Solutions: Ongoing Collaborative Research between the Synoptic Climatology Lab, Los Angeles Urban Cooling Collaborative, and the 3M Corporation

Laurence Kalkstein

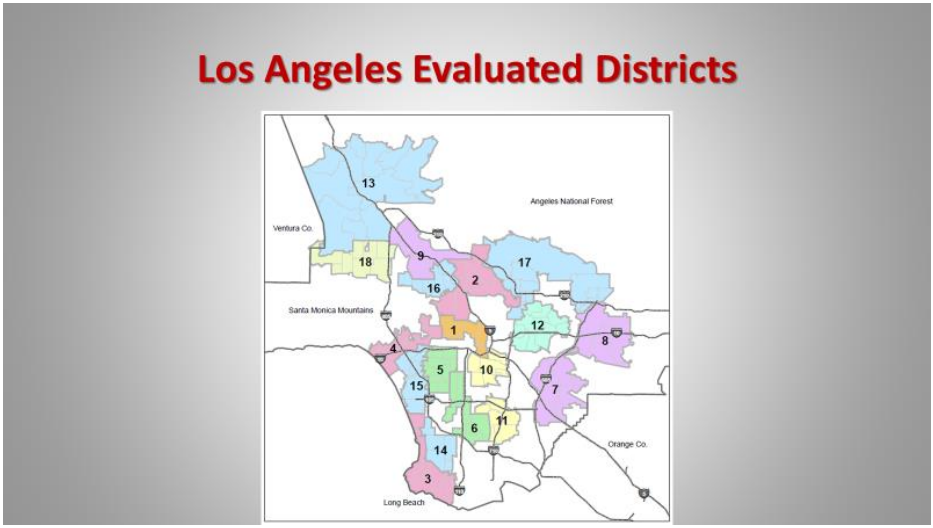
For the past several years, members of the ISB, through the Synoptic Climatology Lab, have been collaborating with academics, private enterprise, and numerous non-profits to evaluate how materials such as reflective roofing and more widespread use of tree planting can decrease urban temperatures during excessive heat events and concurrently decrease heat-related mortality. These efforts have led to two important partnerships: the development of the Los Angeles Urban Cooling Collaborative (LAUCC) and joint research with the 3M Corporation, which manufactures an array of products that can increase urban albedo significantly.

LAUCC was founded by ISB member Larry Kalkstein and Edith deGuzman, Research Director of TreePeople, one of the largest non-profits in the Los Angeles area. Together they brought together an array of organizations to develop a large inter-disciplinary consortium which evaluates the physical and social implications of urban cooling using reflective materials and greater amounts of vegetation cover. Several ISB members, including Scott Sheridan and Adam Kalkstein, are also involved in this effort. LAUCC received a sizable grant from the U.S. Forest Service to determine meteorological changes and associated mortality decreases during excessive heat events in Los Angeles County under four separate “cool solutions” scenarios, which increase urban albedo and vegetation cover. The two most aggressive scenarios showed reductions of up to 30 percent in heat-related mortality, even if urban temperatures were only reduced by a couple of degrees. Beyond the quantitative results of the study, LAUCC is unique in its multi-disciplinary collaboration; the partnership includes the organizations listed below.

Member organizations of LAUCC

At present, LAUCC is completing its second year of work, which includes a unique district-by-district analysis of Los Angeles to determine which areas of the urban area are most vulnerable to negative heat-health outcomes, and to find which districts would benefit most from the implementation of these cool cities technologies.

The poorer districts, colored in yellow, green, and orange, show potential mortality reductions of over 35 percent during some intense heat events. The Forest Service contract has also funded the development of workshops for other vulnerable cities in the U.S.; we are presently considering similar work for New York or Minneapolis, and Dr. Kalkstein, along with other LAUCC members, sponsored a workshop in Minneapolis to explore future collaborations in March, 2019.



Districts evaluated in Los Angeles

The Synoptic Climatology Lab has also gained funding from the 3M Corporation to evaluate the meteorological impact of their reflective roof products in two large U.S. urban areas, Boston and Chicago. The potential positive influence of cool roof technologies is very large; our results suggest that a 0.15 albedo increase in the general urban area of Chicago, through the use of reflective roofing products, can lead to approximately 200-300 lives saved in a decade during excessive heat events in that city. Temperature reductions are estimated to be up to 2°C during these events. The 3M work has led to a recent peer-reviewed manuscript in the flagship journal of American Society of Testing and Materials (ATSM), which is the organization that sets market-relevant standards for many products worldwide (https://www.astm.org/DIGITAL_LIBRARY/STP/index.html). Authors on the manuscript, entitled, "The Potential Impact of Cool Roof Technologies Upon Heat Wave Meteorology and Human Health in Boston and Chicago" include not only ISB members, but individuals from the Cool Roof Rating Council, Global Cool Cities Alliance, 3M, and Arizona State University. A second

manuscript, uncovering a rather strong winter heat/health sensitivity in Los Angeles, was also indirectly spawned by this research. Entitled "Heat/Mortality Sensitivities in Los Angeles During Winter: A Unique Phenomenon in the United States", it appears in the Springer journal *Environmental Health*, and it is authored almost entirely by ISB members (https://ehjournal.biomedcentral.com/articles/10.1186/s12940-018-0389-7#Sec7).

Dr. Kalkstein has been invited to be a keynote speaker to discuss these partnerships and "cool cities" research results at the annual meeting of the Cool Roof Rating Council in Las Vegas, NV in June, 2019. He, along with other LAUCC and 3M partners, will be presenting their results at the National Adaptation Forum in Madison, Wisconsin in April, 2019.

There is great potential for ISB members to work in this research arena, as corporations, government agencies, and urban stakeholders are becoming more involved in ways to keep cities cooler during excessive heat events. Clearly, the technology is presently available to improve urban climatology and air quality, and it is an area where our membership can contribute greatly. For more information, contact Dr. Kalkstein at larryk@miami.edu .

American Meteorological Society, 10th Conference on Environment & Health Biometeorology Core Science Keynotes on Heat and Health

Jennifer Vanos

As part of the 10th Anniversary on the AMS Board on Environment and Health (BEH), Dr. Ollie Jay (University of Sydney) and Dr. Rebekah Lucas (University of Birmingham) provided in-depth overviews of heat and health impacts in a session entitled *"Thermal Extremes and Health: Understanding the Biometeorological Pathways from Exposure to Outcomes"*. The International Society of Biometeorology (ISB) kindly provided partial support to both

speakers to attend the AMS meeting as keynote speakers in the Environmental and Health conference. Their "Core Science Keynote" talks were a huge success and educated key sectors of academia, government, education, and private industry on important considerations when studying extreme heat and human health and providing recommendations.

The recorded presentations can be found at: https://ams.confex.com/ams/2019Annual/meetingapp.cgi/Session/48482

The Board and Environmental and Health will be hosting their 11th Conference at the 100th AMS Annual Meeting in Boston, MA, USA from Jan 12 – 16th, 2020.

Ollie Jay and Rebekah Lucas

Drs. Jay and Lucas were hosted by ISB members Kristie Ebi (BEH Chair) and Jennifer Vanos (Vice Chair), as well as Dr. Kim Knowlton. Vanos is also the ISB North American Councilor. Other ISB members involved in the BEH include David Hondula, Mary Wright, and Glenn McGregor. ISB members who presented in the Environment and Health Sessions include Hunter Jones, Scott Sheridan, Ariane Middel, Andreas Matzarakis, Paul Chakalian, Peter Crank, Castle Williams, and many others throughout the full program.

We hope you will consider partaking in the AMS Annual Meeting next year in Boston! Past ISB President, Dr. Glenn McGregor, was instrumental in establishing and making successful the Board on Environment and Health (BEH), and AMS and ISB have a continuing strong long-term relationship.

Update from the Institute of Environmental Medicine, Technical University of Munich

Athanasios Damialis

From our Institute, we are glad to announce that we have been implementing a new project (funded by the Bavarian Ministry of Health and Consumer Protection, Germany) about '*Thunderstorm Asthma in the region of Augsburg, Germany*'.

Moreover, we are now starting a project entitled '*Biotic and abiotic effects on pollen production and allergenicity of birch and related health impacts*' (funded by the German Research Foundation), which refers to the Europe-wide study of birch, regarding pollen production, flowering, pollen allergenicity and microbiome, plus virus co-occurrence, and bioclimatic patterns.

Secondly, we have recently led the publication of the following papers (in Science of the Total Environment)

1. Airborne *Alternaria* and *Cladosporium* fungal spores in Europe: Forecasting possibilities and relationships with meteorological parameters (https://doi.org/10.1016/j.scitotenv.2018.10.419)
2. Human exposure to airborne pollen and relationships with symptoms and immune responses: Indoors versus outdoors, circadian patterns and meteorological effects in alpine and urban environments (https://doi.org/10.1016/j.scitotenv.2018.10.366)

Also, we are in press for a new book chapter, as follows:

Damialis A., Traidl-Hoffmann C., Treudler R. 2019. *Climate change and pollen allergies*. In: Marselle M.R., Stadler J., Korn H., Irvine K.N., Bonn A. (eds). Biodiversity and health in the face of climate change. Springer International Publishing, United Kingdom. (https://doi.org/10.1007/978-3-030-02318-8)

Upcoming Conferences

Tenth Cuban Meteorology Conference

Havana, Cuba, 2 to 6 December 2019

The Cuban Meteorological Society (SometCuba) at the Anniversary 500 of the City of Havana is pleased to announce it during December 2 to 6, 2019 at the **X Cuban Meteorology Congress**, the **Third Seminar-Workshop on Pollution of the Atmosphere** and the **II Seminar on Climatology**. These are held at the San Geronimo University College of Havana and the Tryp Habana Libre Hotel, Havana. Cuba. These events are convened under the auspices of the Institute of Meteorology and the Office of the Historian of the City of Havana. We extend an invitation to all researchers, professionals, civil servants, teachers, students fonds of meteorology, as well as those having to do with contingency plans facing extreme weather situations. This event will provide knowledge and an appropriate forum to discuss and exchange points of view on multidisciplinary research of laws and highly dynamic mechanisms in Atmospheric Sciences. The Organizing Committee hopes that the presentations and round tables, panels, symposia, seminars and conferences that will take place in this multidisciplinary Congress shall provide guidance and information on congressional issues, especially for economic policy makers and environmental planners in our society. The Organizing Committee has the pleasure of inviting all members, both professionals and fonds to present works in the following thematic areas:

- Tropical hurricanes
- Renewable Energy (solar, wind and others)
- Meteorological prediction
- Weather / environmental education
- Numerical and statistical models
- Meteorological instrumentation
- Physics of the Atmosphere
- Applications of APK in Meteorology
- Marine meteorology
- Meteorology and mass media
- Agricultural meteorology
- Meteorological risks and insurance
- Aeronautical meteorology
- Civil protection and defense
- Information processing and data validation
- Methods
- Risks, vulnerability, impacts and mitigation of meteorological disasters
- Geographical Information Systems
- Remote Sensing

Participants who require a letter of invitation to obtain permission from their institution may request it from the President of the Organizing Committee via email: sometcuba@insmet.cu and andres.planas@insmet.cu.

Important dates

September 30, 2019	Abstract deadline
October 15, 2019	Acceptance notification
November 10, 2019	Paper deadline
December 2, 2019	Accreditation at the Hotel Tryp Habana Libre
December 2, 2019	Inauguration of the Congress and work session (Colegio San Gerónimo)

December 3-6, 2019 Working sessions at the Tryp Habana Libre hotel

December 3, 2019 Meeting of the Sometcuba executive with delegates and foreign guests at the headquarters of SometCuba

AA2019 Advanced Aerobiology Course, 25-31 August 2019, Payerne (Switzerland)

Payerne, Switzerland, 25 to 31 August 2019

The IAA Advanced Aerobiology course series is aimed at understanding aerobiological processes and providing a solid background for the interpretation of aerobiological observations.

Organised by the **Federal Office of Meteorology and Climatology MeteoSwiss** under the aegis of the **International Association for Aerobiology** (IAA) and the **EUMETNET Programme AutoPollen.**

Course themes: automatic and real-time pollen monitoring, instrument calibration, data analysis, machine learning, influence of weather parameters. Small groups of participants will focus on particular topics of interest in greater depth and present a summary of their work at the end of the course.

Course fees (including meals and an excursion): for members of the IAA and affiliated societies, as well as EUMETNET AutoPollen participants: CHF 450.-. For all others: CHF 550.-

Registration deadline: extended to 22 March 2019. A few places are still available.

Basic Course on Aerobiology

Lyon, France, 15 to 20 July 2019

The course, offered by the European Aerobiology Society and RNSA, is about the recognition of the main pollen types and most frequent fungal spores. The theoretical part of the course covers the field of botany, aerobiology, allergy, and modelling.

Registration is open through May 2019, contact rnsa@rnsa.fr.