



23rd International Congress of Biometeorology



May 14-17, 2023
Tempe, Arizona, USA



Program at a Glance

Sunday, May 14: Welcome Reception
6:00-8:00pm ASU Sun Devil Stadium
Lagunitas Lookout

Mountain Standard Time (Arizona does not observe Daylight Saving Time)			
	Monday 15	Tuesday 16	Wednesday 17
8:00-9:00am	Breakfast in Arizona Ballroom Poster setup opportunity	Breakfast in Arizona Ballroom Morning meeting: La Paz: Students and New Professionals	Breakfast in Arizona Ballroom Morning meetings: Ventana A: Phenology Commission Ventana B: Animal Commission La Paz: Community climate observations workshop
	<div style="border: 1px solid black; padding: 5px;"> <p>Session topic guide</p> <p>Animal: Animal biometeorology</p> <p>Health: Human health and epidemiology</p> <p>Human: Human biometeorology</p> <p>Plant: Plant biometeorology, phenology, agriculture</p> <p>Society: Climate and society (includes tourism)</p> <p>Urban: Urban biometeorology</p> </div>		
9:00-10:00am	Arizona Ballroom: Opening Ceremony and keynote address	Arizona Ballroom: Morning keynote address	Arizona Ballroom: Morning keynote address
10:00-10:30am	Break and refreshments Poster setup opportunity Arizona Ballroom	Break and refreshments Informal poster viewing Arizona Ballroom	Break and refreshments Informal poster viewing Arizona Ballroom
10:30am-12:00	Morning sessions: Ventana A: Urban1 Ventana B: Health1 Ventana C: Society1	Morning sessions: Ventana A: <i>Urban4 - Special session on Cooling Singapore</i> Ventana B: Human1 Ventana C: Society3	Morning sessions: Ventana A: Plant2 Ventana B: <i>Human4 - Special session with Tromp Award</i> Ventana C: Animal1
12:00-1:30pm	Informal poster viewing and lunch in Arizona Ballroom	Formal poster session and lunch in Arizona Ballroom	ISB Informational Meeting in Arizona Ballroom (12:15 start) Lunch and informal poster viewing also available in Arizona Ballroom
1:30-3:00pm	Early afternoon sessions: Ventana A: Urban2 Ventana B: Health2 Ventana C: Society2	Early afternoon sessions: Ventana A: Urban5 Ventana B: Human2 Ventana C: Society4	Early afternoon sessions: Ventana A: Plant3 Ventana B: Health4 Ventana C: Animal2
3:00-3:30pm	Break and refreshments Informal poster viewing Arizona Ballroom	Break and refreshments Informal poster viewing Arizona Ballroom	Break and refreshments Poster breakdown Arizona Ballroom
3:30-5:00pm	Late afternoon sessions: Ventana A: Urban3 Ventana B: Health3	Late afternoon sessions: Ventana A: Plant1 Ventana B: Human3 Ventana C: <i>Society5 - Special session on heat wave ranking</i>	Arizona Ballroom: Afternoon keynote address and Closing Ceremony (ends at 4:30pm)
5:00-6:00pm	Evening meeting: Ventana C: IJB Editorial Board	Evening meeting: La Paz: Climate and Health Commission	Desert Botanical Garden Open Congress Dinner and Celebration (until 10pm)

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Welcome to ICB 2023

On behalf of the Executive Board of the International Society of Biometeorology, it is with great pleasure that I welcome you to the Society's 23rd triennial International Congress.

The Society was founded in 1956 with the purpose of providing one international organization for the promotion of interdisciplinary collaboration of scientists concerned with the direct or indirect interaction between the atmosphere and all living organisms, and the development of the field of meteorology in relation to humans, other animals, and plants.

The Congress program of Urban to Global Sustainability and the Keynote speakers reflect the purpose and the diversity of Commissions within the Society. The Congress would not have been possible with our sponsors and partners, as well the hard work of the Local Organising and Scientific Review Committees. And of course, without you the delegates, there would be no Congress.

So once again, welcome, and enjoy the 23rd International Congress of the International Society of Biometeorology.

Marie R Keatley
President- International Society of Biometeorology

Welcome to Arizona and ASU

My colleagues and I are thrilled to welcome you to beautiful Arizona for the 23rd Congress. Arizona is home to incredible and iconic landscapes, including the Grand Canyon, one of the world's most visited natural attractions. We hope you have the opportunity to spend some time outdoors as part of your visit, whether it's a road trip across the state or a quick visit to a local highlight. You will enjoy a taste of the Southwest at our Congress Dinner on Wednesday evening at the Desert Botanical Garden, but please also enjoy the vibrant food, music, arts, and culture available in Tempe or our neighboring cities of Phoenix and Scottsdale.

Arizona State University is our host institution for this Congress, and I am incredibly grateful to the support we have received from staff across multiple units and departments to bring this event to life. You will have the chance to meet some of them this week, and I am confident that you will glean from them the spirit of innovation and public service that defines our university. ASU has been ranked as the most innovative university in the United States for eight consecutive years by U.S. News and World Report, a recognition largely attributable to efforts to redefine public education with a new model that is both accessible and impactful. I believe those characteristics—access and impact—closely resonate with our shared goals for the future of biometeorology. I look forward to continuing to shape that vision with you all this week, and hope you have a wonderful visit.

David M Hondula
Organizing Committee Chair for ICB2023

ICB2023 Program and Organizing Committees

Scientific Program Committee

Paul Beggs, Australia
Alicja Bortkiewicz, Poland
Tanja Cegnar, Slovenia
Kathryn Conlon, USA
Theresa Crimmins, USA
Jennifer Fitchett, South Africa
David Hondula, USA
Adam Kalkstein, USA
Marie Keatley, Australia
Magdalena Kuchcik, Poland
Angela Lees, Australia
Liang Liang, USA
Karin Schütz, New Zealand
Daniel Vecellio, USA
Lance Watkins, USA

Local Organizing Committee at Arizona State University

Brandon Catour
Andrea Hamilton
David Hondula
Megan Martin
Ariane Middel
Michelle Oldfield
David Sailor
Jennifer Vanos
Mary Wright

Land Acknowledgement

In January 2021, the Mayor and Council of the City of Tempe approved a resolution commemorating the historical and cultural significance of the historic homelands in Tempe of the O'Odham, Piipaash and their ancestors with the following acknowledgement:

We wish to acknowledge that Tempe is the homeland of the Native people who have inhabited this landscape since time immemorial. Anthropological studies document large and advanced Ancestral O'Odham settlements located throughout the entirety of present-day Tempe and recognize the ancestral lands of the O'Odham (known as the Pima), Piipaash (known as the Maricopa), and their ancestors as extending far beyond our community. This land continues to be spiritually connected to the O'Odham of the Salt River Pima-Maricopa Indian Community and Gila River Indian Community. The SRP-MIC and GRIC, located northeast and south of Tempe, respectively, are confederations of two unique groups with their own languages, customs, cultures, religions, and histories; the O'Odham and the Piipaash. Both the O'Odham and the Piipaash are oral history cultures.

The landscape is sacred to the O'Odham and Piipaash and reflects cultural values that are central to their way of life and their self-definition. Their oral history and song culture are indelibly tied to tangible places that are associated with specific historic, cultural, and religious values. Settlement patterns, advanced irrigation practices, and other lifeways driven by a deep understanding of and respect for the landscape are directly attributable to the ancestors of the O'Odham and Piipaash and served as the template for the establishment of Tempe. We accept the responsibility of stewarding those places and solemnly pledge to consider this commitment in every action.



General Information

Congress Location

The 2023 Congress is headquartered at the Memorial Union on the Tempe Campus of Arizona State University in Tempe, Arizona. The Memorial Union is the central hub for many on-campus activities and services, and includes conference space, dining facilities, and administrative offices. The Memorial Union opened in 1956 and was named to serve as a living memorial for those who have courageously served the United States in the military services. An information desk is available on the main floor of the Memorial Union for lost and found and information about campus services and programs. Information desk phone: 1-480-965-5728



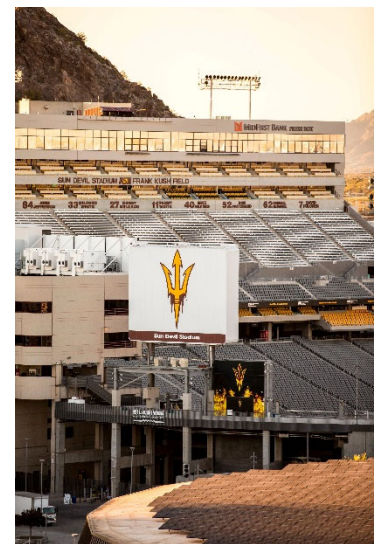
Congress activities will be in meeting rooms on the second floor. Plenary sessions, meals, posters, and registration information will be in the Arizona Ballroom.

The address for the Memorial Union is 301 East Orange Street, Tempe, Arizona, 85281. Daily fee parking is available in the Apache Boulevard Parking Structure. More details regarding on-campus parking can be found online: <https://cfo.asu.edu/parking>.

Welcome Reception – Sunday, May 14, 6pm

The Welcome Reception for ICB2023 will be held at Arizona State University's Sun Devil Stadium in the Lagunitas Lookout. The stadium is the home venue for the university's intercollegiate American football team, hosts a variety of university and community events, and has a capacity of 53,599. Its construction between two mountain buttes offers a unique setting for intercollegiate sports. Sun Devil Stadium hosted Super Bowl XXX in 1996.

The address for Sun Devil Stadium is 500 East Veterans Way, Tempe, Arizona 85287. Congress participants should access the stadium through the SAF entrance on the northeast side of the stadium or the Southwest entrance on Veterans Way. Stadium security will help direct visitors to an appropriate entrance. Free parking is available in ASU North Lot 59; please inform any security personnel that you are attending a stadium event.



Congress Dinner and Celebration – Wednesday, May 17, 6pm

The ICB2023 Congress Dinner and Celebration will be held at Phoenix's Desert Botanical Garden (DBG). DBG is a living museum of over 50,000 plants representing more than 4,000 different species, including 519 that are rare or endangered. The Garden spans 140 acres and welcomes 870,000 visitors each year.



The Garden's vision is to be the premier center in the world for the exhibition, research and conservation of desert plants. The Garden strives to be an indispensable resource for learning about cactus, agave and other desert plants of the Sonoran Desert and the world.

Bus transportation will be provided to and from the Desert Botanical Garden.

OUTGOING BUS #1 will board from ASU Tempe Campus (ASU Bookstore/Orange St.) at 4:45pm immediately following the Closing Ceremony and arrive at DBG by 5:15pm. Participants who *do not* wish to return to their hotel between the Closing Ceremony and Dinner should use this option. Congress staff and volunteers will guide participants to the bus.

OUTGOING BUS #2 will board from Myrtle Avenue/Canopy by Hilton Tempe Downtown at 5:30pm and arrive at DBG by 6:00pm. Participants who *do* wish to return to their hotel between the Closing Ceremony and Dinner should use this option. Maps will be distributed on site to guide participants to the meeting location.

RETURNING BUS #1 will depart from the Desert Botanical Garden at 9:00pm.

RETURNING BUS #2 will depart from the Desert Botanical Garden at 10:00pm.

Both returning busses will drop passengers at the Canopy by Hilton Tempe Downtown.

Congress participants wishing to travel to the Garden on their own should navigate to 1201 N. Galvin Parkway, Phoenix AZ 85008. A rideshare service should cost less than \$20 in each direction.

Congress Badges

Personalized name badges will be provided to all registered Congress participants. Please wear your badge throughout the Congress to ensure access to all meeting rooms, meal service, and other Congress functions. Your name badge will serve as your admission ticket to the Congress Dinner and Celebration at Desert Botanical Garden on Wednesday evening.

Daily Food and Beverage Service

Breakfast, lunch, snacks, and beverages will be provided for Congress participants on Monday, Tuesday, and Wednesday. Breakfast will be served 8am-9am in the Arizona Ballroom ahead of the morning plenary sessions. Lunch will be served 12noon-1:30pm in the Arizona Ballroom. All meals include vegetarian, vegan, and gluten free options. Coffee and tea will be continually refreshed in the Arizona Ballroom throughout the program; water stations will be available in each of the Ventana rooms. Snacks will be provided during the afternoon breaks in the Arizona Ballroom.

Oral Presentation Information

Oral presentations are scheduled in 15-minute intervals. Speakers should prepare for 11 minutes of prepared remarks, with three minutes allocated for discussion and one minute allocated for transition time between presentations. Speakers are invited to bring a USB flash drive with their slides in PowerPoint or pdf format to upload on site to a laptop in each of the meeting room. Congress staff and volunteers will also be able to provide on-site support to upload slides to a cloud environment as a second option. Congress participants are asked to use laptop computers provided in each of the parallel session rooms to maintain continuity for in person and virtual attendees.

Poster Information

Posters will be displayed in the Arizona Ballroom throughout the entire Congress. Participants sharing a poster should plan to set up their poster Monday morning before the Opening Ceremony or in the mid-morning break. Supplies and volunteers will be available on site to help participants hang their posters. **The formal poster session will take place during Tuesday's lunch session.** No conflicting meetings have been scheduled for this time and all Congress participants are requested to attend to create a lively and dynamic atmosphere! Posters may be removed during the afternoon break on Wednesday. Posters have been assigned unique IDs and are organized into the Congress's six topic areas; a full list of poster titles with IDs is available at the end of the program. Poster presenters are asked to hang their poster on the board labeled with their unique ID.

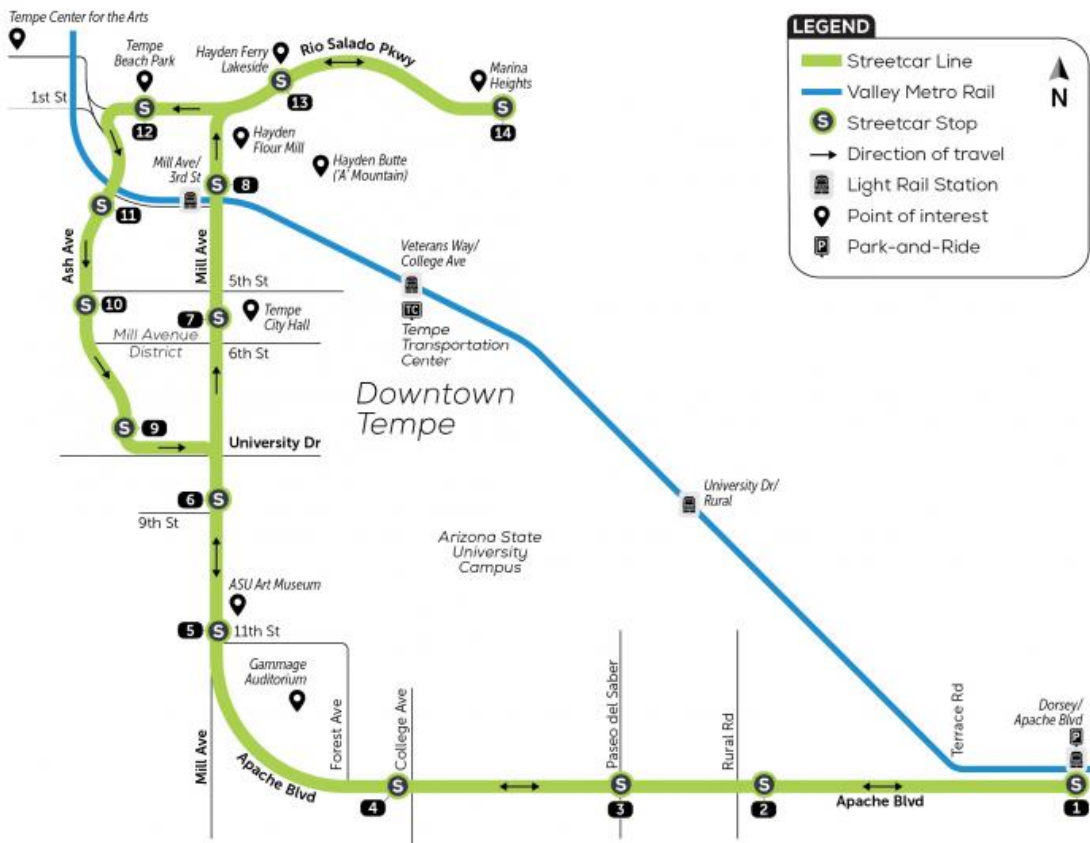
Internet Access

Congress participants are invited to use the ASU Guest wireless connection at no charge. Registration is required to use the ASU Guest network, which will be available through a web browser upon connecting to the network. Please note that the "ASU Guest" wireless connection is not an encrypted network. This connection only allows general internet access for Web http, https, and VPN. Eduroam is also supported at ASU. Technical support for wireless access can be found at <https://tech.asu.edu/wireless-connections>.

Public Transportation

Arizona State University and its surrounding neighborhoods are well served by multiple public transportation options. The Tempe Streetcar opened in May 2022 and provides free service in the immediate vicinity of ASU, as well as connections to regional transportation options including the regional light rail. The Mill Avenue and 11th Street or College Avenue and Apache stops are the closest to the Congress venue along the Streetcar route; light rail users should disembark at the Veterans Way/College Avenue stop and walk south along College Avenue to the Memorial Union.

A one way light rail ticket is \$2.



A free local circulator bus system called Orbit is also available with many stops in the immediate vicinity of ASU. The public transportation system, including Orbit routes, is well integrated with most online GPS and wayfinding tools. Additional information is available on the website for Valley Metro, the regional transit authority, at www.valleymetro.org.

Joining Virtually

Registered Congress participants are invited to view a live stream of all plenary and oral presentations if unable to attend in person. A Zoom meeting room will be open for the entire meeting and moderated by event staff. The plenary sessions will be streamed in the “main” Zoom room and parallel sessions will be available in virtual breakout rooms. Event staff moderating the Zoom room will help guide participants to the correct breakout room. Separate links will be made available for Commission and specialty meetings by the lead organizers of those events.

The live stream is available at <https://asu.zoom.us/my/icb2023>. Most remote participants will be automatically placed in a waiting room and will be admitted by the moderator.

Participants providing virtual presentations have been asked to submit pre-recorded talks that will be shown in the meeting rooms and on the live stream.

Tromp Award

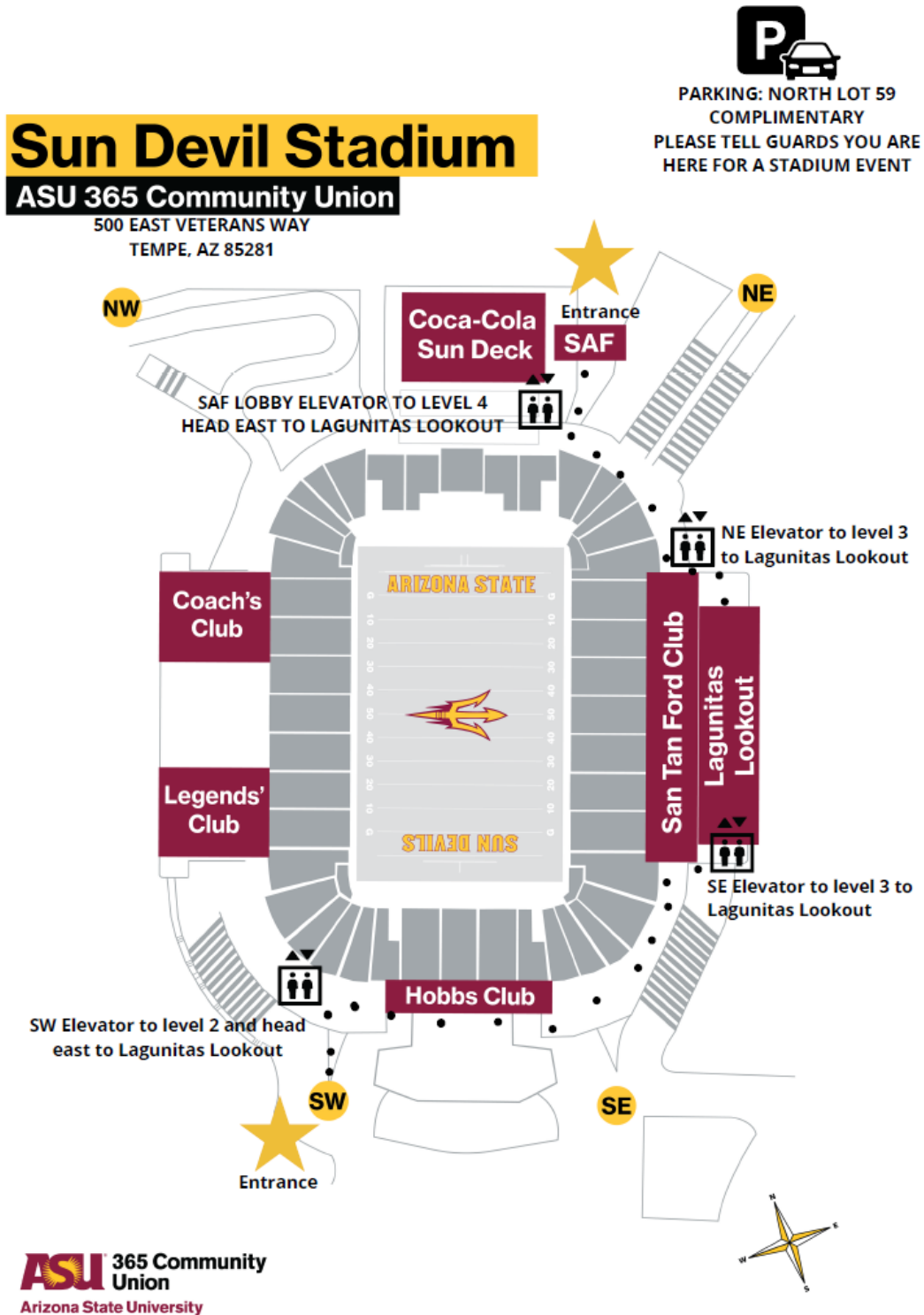
The International Society of Biometeorology presents the Tromp Scientific Award to the young scientist who has developed the most meaningful peer-reviewed manuscript over the past three years prior to each International Congress. The Tromp Scientific Award is sponsored by the Dutch Foundation for Biometeorological Research and awarded by the International Society of Biometeorology.

Congratulations to Dr. Loïc Gillerot of University Gent and University Leuven, Belgium for winning the 2023 Tromp Award! Dr. Gillerot was recognized for the manuscript “Forest structure and composition alleviate human thermal stress,” published in *Global Change Biology* in 2022.

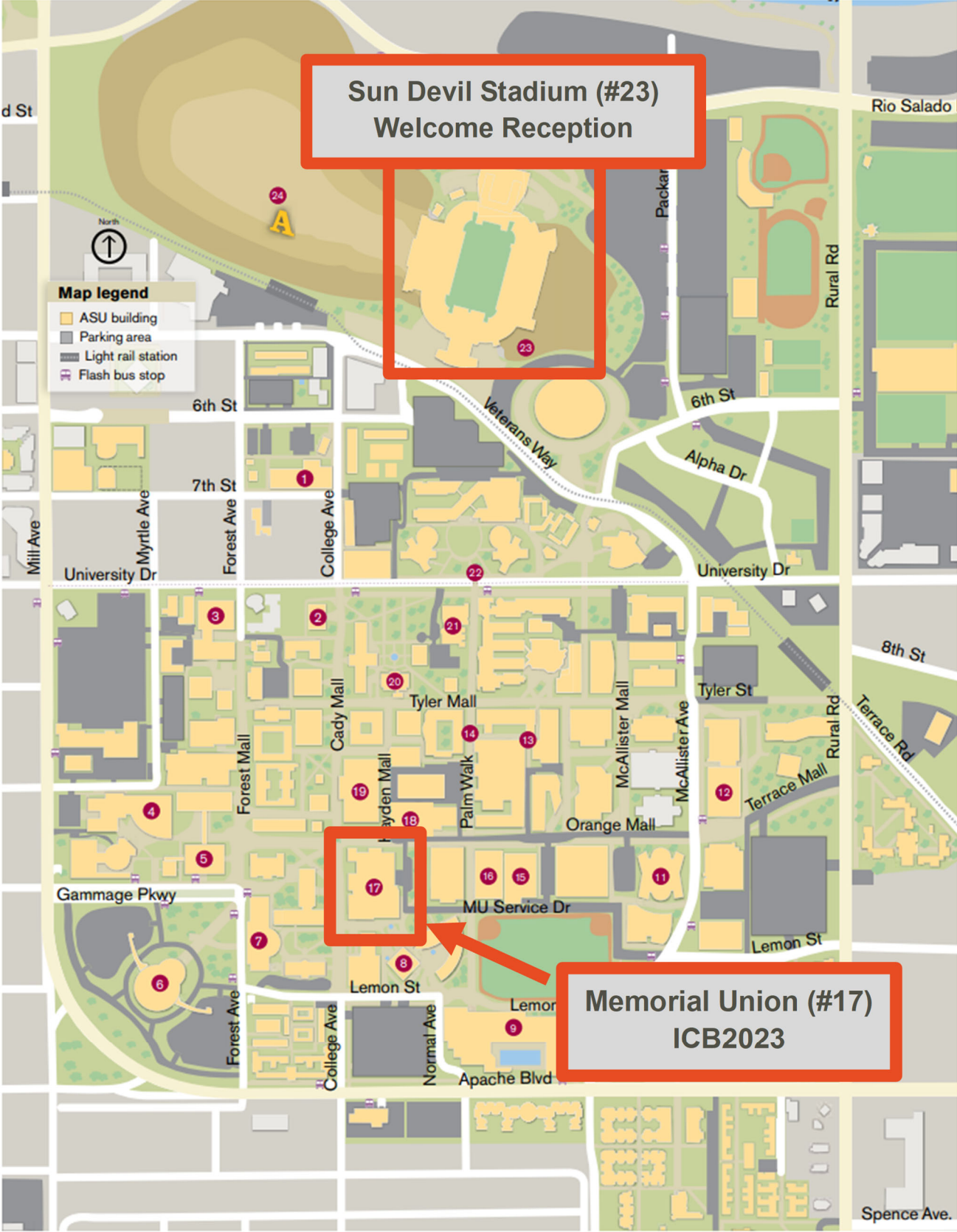
Dr. Gillerot’s award winning paper will be presented at the start of the Human Biometeorology #4 session on Wednesday morning in the Ventana B room.

Venue Maps

Sun Devil Stadium – Sunday Night Reception at Lagunitas Lookout



ASU Tempe Campus (location guide on next page)



ASU Tempe Campus location guide (map on previous page)

1 College Avenue Commons is a mixed-use facility including the Future Sun Devil Welcome Center, the ASU School of Sustainable Engineering and the Built Environment, and the Sun Devil Marketplace.

2 Wrigley Hall accommodates the Julie Ann Wrigley Global Institute of Sustainability and the School of Sustainability. The building has rooftop wind turbines to help provide clean energy, sensor-controlled lighting systems and water efficiency fixtures throughout.

3 Design North and South house architecture and design disciplines as part of the Herberger Institute for Design and the Arts. The buildings include student studio spaces, a research lab, design research studios, a rooftop solar and day lighting testing area, photography and video services, and a slide and media library.

4 The ASU Art Museum was named the single most impressive venue for contemporary art in Arizona by Art in America magazine, and houses a collection of more than 12,000 objects, with emphasis on new ideas and media.

5 Farmer Education Building is one of several that provide a home to ASU's Mary Lou Fulton Teachers College. Constructed in 1960, the building honors Hiram Bradford Farmer, the first principal and faculty member of the Arizona Territorial Normal School — which would eventually become ASU.

6 Gammage Auditorium is one of architect Frank Lloyd Wright's final designs. Constructed in 1964, the building is named for Grady Gammage, the legendary ASU president who led Arizona State College's campaign in the state legislature for a change to Arizona State University in 1958.

7 Student Services Building centralizes the majority of support services for students, from applying for admission to paying bills and taking care of financial aid. Graduate Admission Services can also be found here.

8 The W. P. Carey School of Business features a spacious courtyard and peaceful water fountains connecting the two business buildings together. This is a gathering place for students to study, relax or have a cup of coffee at Starbucks.

9 Sun Devil Fitness Complex features a variety of exercise equipment, including adaptive equipment for students with injuries or disabilities, a swimming pool, indoor and outdoor jogging tracks, two fully appointed weight rooms, courts, group fitness classrooms, a juice bar, and much more.

10 Barrett, The Honors College is the nation's first four-year honors residential college within a top-tier public university. Barrett sits on nine acres and features an amphitheater, computer labs, a fitness center, a dining hall with a covered terrace, a garden and a special event dining room.

11 Armstrong Hall houses The College of Liberal Arts and Sciences and is The College's first stand-alone building since it was founded in 1954. Armstrong Hall is named for John S. Armstrong, who was instrumental in supporting the founding of Tempe Normal School in the Arizona legislature.

12 The Biodesign Institute buildings are a 350,000-square-foot facility designed to foster the fusion of previously distinct areas of science. The architectural elements reinforce the idea that science brings illumination, discovery and connection to our future.

13 The Engineering Center is the main hub for students in the Ira A. Fulton Schools of Engineering. This group of buildings, connected by shared courtyards and hallways, is home to research and instructional labs for the Fulton Schools of Engineering.

14 Palm Walk is the most photographed site on the Tempe campus, and is a popular north-south campus corridor. From 2016 to 2018, the century-old palm trees were replaced with new date palms that provide more shade for pedestrians and fruit for the university's annual date harvest.

15 Sun Devil Campus Stores is more than just a place to buy or rent textbooks. They also sell school supplies and a huge variety of ASU-branded clothing and gifts.

16 Computing Commons offers wired classrooms, meeting spaces and a Tech Studio location, where students can go for solutions to hardware problems. The Sun Devil Campus Stores Technology Center on the first floor offers computer gear with education discounts.

17 Memorial Union is the campus community center. The MU houses numerous dining options, student services, study spaces, the Pat Tillman Veterans Center, Changemaker Central and student lounge spaces.

18 The Student Pavilion is home to Offices for Undergraduate Student Government, cultural coalitions, the Programs and Activities Board, interactive academic classrooms, and University Academic Success Programs.

19 Hayden Library was originally built in 1966 and was recently renovated. Hayden is the largest of ASU Libraries' eight on-campus facilities and features enhanced student space with added seating, state-of-the-art learning labs, active print collections, and an entire floor devoted to innovation.

20 Old Main is the oldest building on campus and the first building in Tempe to be wired for electric lighting. The Victorian structure is now listed on the National Register of Historic Places.

21 Health Services Building houses ASU Health Services, a fully accredited outpatient student health care clinic offering an allergy clinic, women's health services, contraception services, primary care, sports medicine, preventative health care and much more.

22 University Bridge is a pedestrian overpass that connects the residence halls, athletic facilities and parking lots on the north side of campus to the main areas of campus on the south side of University Drive. The steps were designed by a chiropractor to place the least amount of pressure on the lower back and legs.

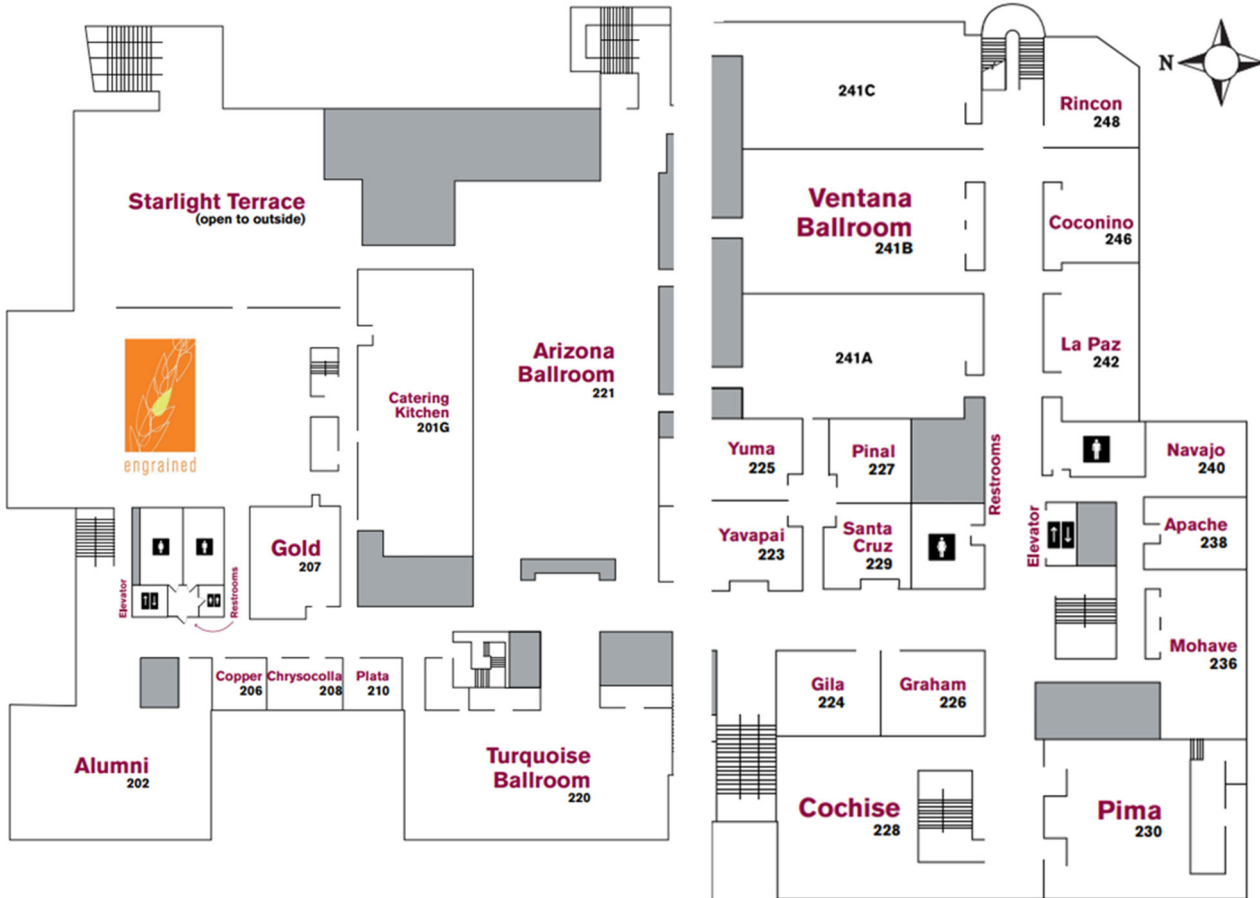
23 Sun Devil Stadium and Desert Financial Arena are the proud homes of ASU's rich tradition of Sun Devil Athletics. Sun Devil Stadium, home to ASU football, is nestled between two buttes. Desert Financial Arena is the home of men's and women's basketball as well as volleyball, gymnastics and wrestling. Both host graduation ceremonies, concerts and events.

24 "A" Mountain is named after the letter "A" that adorns it. The "A" is 60 feet from top to bottom and was built using reinforced steel and concrete in 1955. Each year, during the week leading up to the ASU vs. UofA football game, the Student Alumni Association guards the beloved gold "A" from being painted with rival colors.

Note: The Julie Ann Wrigley Global Institute of Sustainability and the School of Sustainability (formerly location #2) are now located in the Walton Center for Planetary Health at the corner of University Drive and Rural Road.

Memorial Union – Meeting Rooms (all on second floor)

**Memorial Union
Second Floor Room Features**
rev. March 2018



Detailed Program

SUNDAY, MAY 14

Welcome Reception at Sun Devil Stadium [6:00-8:00]

Including special cultural performance

The address for Sun Devil Stadium is 500 East Veterans Way, Tempe, Arizona 85287. Congress participants should access the stadium through the SAF entrance on the northeast side of the stadium or the Southwest entrance on Veterans Way. Stadium security will help direct visitors to an appropriate entrance. Free parking is available in ASU North Lot 59; please inform any security personnel at the parking lot that you are attending a stadium event. See venue map in General Information section.

MONDAY, MAY 15

Welcome and Keynote Address [9:00-10:00]

ARIZONA BALLROOM

David Hondula, Chair, ICB2023 Organizing Committees

Bert Holstlag, President, European Meteorological Society

Marie Keatley, President, International Society of Biometeorology

Panel of Arizona State University Global Futures Scholars

Dan Childers, School of Sustainability

Matei Georgescu, School of Geographical Sciences and Urban Planning

Sarah Porter, Kyl Center for Water Policy

David Sailor, School of Geographical Sciences and Urban Planning

Break and Poster Setup [10:00-10:30]

ARIZONA BALLROOM

Morning Parallel Sessions [10:30-12:00]**VENTANA ROOMS A, B, C**

Urban Biometeorology 1		VENTANA A
Tugba Dogan	The effect of the COVID-19 lockdown on the surface urban heat island in Prague, Czech Republic	
Kamila Pawłowska	Modelling of the Urban Heat Island effect with special regard to natural base solutions	
Balogun Ifeoluwa Adebawale	Surface thermal characteristics and energy fluxes over different Local Climate Zones in Akure, Nigeria	
Hitenkumar Motiyani (VIRTUAL)	Remotely Sensed Land Surface Temperature and its relationship with thermal comfort	

Human Health and Epidemiology 1		VENTANA B
Mary Wright	A meta-analysis of social factors predicting individual and household-level heat-related illness	
Alindomar Lacerda Silva	Heat and Cold Waves in the Cleveland Metropolitan Area and its relationship with mortality: an overview from 1975 to 2018	
Aleš Urban	Do early heat warning systems reduce the risk of heat-related mortality in Europe?	
Dragan Milosevic	Extreme heat, mortality and hospital admissions in Serbia	
Samuel H. Gunther	Chronic extreme heat during pregnancy is associated with increased risk of gestational diabetes and small for gestational age birth, but decreased risk of preterm birth, in Singapore	
Claudia Di Napoli (VIRTUAL)	Monitoring human wellbeing without gaps: reanalyses at the service of climate services for health	

Climate and Society 1		VENTANA C
V. Kelly Turner	Shade Deserts, Shade Oases: Disparities in Shade Infrastructure Delivery in the City	
Shaylynn Trego	Evaluating urban heat mitigation across networks of plans	
Xiaojiang Li	Examining equity to heat stress in 14 US major cities using GPU-accelerated SOLWEIG modelling	
Kevin Lanza	Heat vulnerability and recommended adaptation responses of Latino and Black residents in a low-income U.S. community	
João Vasconcelos	Barriers to adaptation to summer indoors heat in the elderly population. A follow-up study.	

Lunch and Informal Poster Viewing [12:00-1:30]**ARIZONA BALLROOM**

Early Afternoon Parallel Sessions [1:30-3:00]**VENTANA ROOMS A, B, C**

Urban Biometeorology 2		VENTANA A
Michal Belda	Simple and complex measures for improvement of urban thermal comfort: an LES modeling study	
Isaac Buo	High-resolution thermal exposure and shade maps for cool corridor planning	
Jelena Dunjić	Cooling effect of evaporative misters in outdoor urban settings. Case study of Novi Sad, Serbia	
Magdalena Kuchcik	The role of urban parks in mitigating exposure to thermal stress of the people living nearby.	
Claire Gallacher	Thermal comfort mapping for evidence-based urban planning; an interdisciplinary approach for the case study of Dresden, Germany	
Parker King	The Contributions of Roads and Other Paved Surfaces to Heat Microenvironments in Small Cities and Towns	

Human Health and Epidemiology 2		VENTANA B
Aleš Urban	Links between weather and seasonal influenza epidemics	
Ogone Motlogeloa	Exploring the role of extreme climatic events in the incidence of respiratory disease in South Africa	
Eduardo Kruger	Investigating the relationship between air temperature and respiratory morbidity in children and the elderly in Porto Alegre, Brazil, before and during the COVID-19 pandemic	
Robert Davis	Climate and Mortality in Virginia, 2005–2020	
Peter J. Crank	Mental Health and Air Temperature: Attributable Risk Analysis for Schizophrenia Hospital Admissions in Arid Urban Climates	

Climate and Society 2		VENTANA C
Ariel Prinsloo	Quantifying Climate Suitability for Tourism in Réunion Island through a Multi-Index Approach	
Sookuk Park	Koreans' climatic index for cultural tourism	
Jane W. Baldwin	Increasing Health Risks During Outdoor Sports Due To Climate Change in Texas: Projections Versus Attitudes	
Jennifer Fitchett	How accurate is our perception of temperature?	
Surisley Torres Gutiérrez (VIRTUAL)	Worrying trend of UHCI in Cuba.	

Break [3:00-3:30]**ARIZONA BALLROOM**

Late Afternoon Parallel Sessions [3:30-5:00]**VENTANA ROOMS A and B**

Urban Biometeorology 3		VENTANA A
Stevan Savic	The concept of microclimate monitoring in diverse urban spaces during hot summer days	
Jan Geletic	Sky view factor and its effects on thermal comfort in realistic urban environment	
Michal Lehnert	Could mental maps help to improve thermal comfort and reduce heat stress in urban areas? A case study of three Central European cities	
Tania Sharmin	Local climate zones in Cardiff and their connections with urban heat island and outdoor human thermal comfort	
Muge Unal Cilek	Effects of surface cover and shade on courtyard thermal comfort in hot-arid Phoenix, Arizona	

Human Health and Epidemiology 3		VENTANA B
Charles Simpson	Health-impact assessment of rooftop interventions on urban heat during a heatwave in London, England	
Scott C Sheridan	Reducing Heat and Emergency Room Visits With Trees and High-albedo Surfaces in Los Angeles	
Parker King	Heat Exposure Mitigation Through Pavement Reduction Scenarios	
Andreas Matzarakis	The Heat Health Warning System in Germany – As part of heat actions plans	

Evening Meetings [5:00-6:00]

International Journal of Biometeorology Editorial Board

VENTANA C

TUESDAY, MAY 16

Morning Meetings [8:00-9:00]

Students & New Professionals Commission

LA PAZ ROOM

Keynote Address [9:00-10:00]

ARIZONA BALLROOM

Jason Lee, National University of Singapore

“Heat Resilience - a whole of society challenge and approach”

Break [10:00-10:30]

ARIZONA BALLROOM

Morning Parallel Sessions [10:30-12:00]

VENTANA ROOMS A, B, C

Urban Biometeorology 4 - Special Session on Cooling Singapore		VENTANA A
Winston Chow	Cooling Singapore 2.0: Outdoor thermal comfort and the Singapore Green Plan 2030	
Sin Kang Yik	Sensitivity Analyses of Instruments for Microclimatic Measurements to Observe Park Cool Island in Tropical Climates: A Case Study in Singapore	
Graces Ching	Performance evaluation of ENVI-met for seasonality in a tropical urban medium-sized park	
Yuliya Dzyuban	Thermal walk for outdoor thermal comfort evaluation of urban spaces in an Asian city	

Human Biometeorology 1		VENTANA B
Konrad Rykaczewski	Theory-guided improvement of cylindrical radiation thermometers for cost-effective mean radiant temperature measurements for a diverse population	
Cameron C. Lee	Developing a universal mortality-calibrated metric for human thermal comfort	
Ankit Joshi	Predicting human thermal response: heat balance equation vs thermoregulation model	
Andreas Matzarakis	Normalisation of thermal indices in the context of urban environments	
Charles Simpson	Do drought and urban dryness really protect against heat stress? Questionable conclusions from problematic metrics	

Climate and Society 3		VENTANA C
Adriaan Van der Walt	Trend analysis of cold extremes in South Africa: 1960–2016	
Adam Kalkstein	Winds of Change: The Impact of Regional Sea Surface Temperatures on Spatial and Temporal Trends in Tornadoes across the United States	
David M Hondula	Spatial Analysis of United States National Weather Service Excessive Heat Warnings and Heat Advisories	
Kelton Minor (VIRTUAL)	Extreme weather and human sentiment: Global evidence from 7.7 billion social media posts	
Vera Vinogradova (VIRTUAL)	Heat waves on the territory of Russia and their impact on the population according to climate change scenarios for the middle of the 21st century	
Elena Grigorieva (VIRTUAL)	Social vulnerability to Cold climate exposure: Alaska as a case study	

Lunch and Formal Poster Session [12:00-1:30]

ARIZONA BALLROOM

Detailed poster guide at end of program

Early Afternoon Parallel Sessions [1:30-3:00]

VENTANA ROOMS A, B, C

Urban Biometeorology 5		VENTANA A
Charles Simpson	Multi-scale analysis towards personal heat exposure assessment in Southeast England	
Rui Li	Repurposing Mesoscale Traffic Models for Insights into Traveler Heat Exposure	
Negin Nazarian	Project Coolbit: can your watch measure ambient air temperature?	
João Vasconcelo	Assessment of the thermal comfort in Lisbon through the application of roving missions	
Dragan Milosevic	Application of Mobile Micrometeorological Carts (MMCs) and remote sensing for assessment of biometeorological conditions in Novi Sad (Serbia)	

Human Biometeorology 2		VENTANA B
Jennifer Vanos	Extreme Heat in a Changing Climate: A New Approach to Assess Human Survivability and Livability	
Daniel J. Vecellio	Skin wettedness as a limiting factor to heat stress compensability	
Adriaan Van Der Walt	Daytime heat stress across southern Africa according to the Universal Thermal Climate Index (UTCI): an analysis of the climatology and trends for 1979-2021	
Gisel Guzman Echavarria	A Physiological-based Weather Categorization of Extreme Heat Days in the U.S. to determine Regional Personal Cooling Needs	
Konrad Rykaczewski	Impact of Human Body Shape on Convective and Radiative Heat Transfer	

Climate and Society 4		VENTANA C
Mary Munoz Encinas	HeatReady Schools as a complementing tool for FEMA Safer, Stronger, Smarter: A Guide to Improving Natural Hazard Safety.	
Ariane Middel	Science-Policy Disconnect: Perspectives on Co-benefits, Trade-offs, and Disservices of Heat Mitigation Strategies	
Elizabeth Doran	Understanding Heat Risk Perception and Adaptive Capacity in the General Population of the Northeast	
Melissa Guardaro	The Promise of Resilience Hubs	
Morgan Rogers	Cool by Design: A case study on design attributes contributing to heat burdens in schools and residential areas	

Break [3:00-3:30]

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Late Afternoon Parallel Sessions [3:30-5:00]

VENTANA ROOMS A, B, C

Plant Biometeorology 1		VENTANA A
Cameron C. Lee	Investigating multivariate surface air masses as drivers of tree growth	
Geoffrey Henebry	Land Surface Phenologies in Grazed Montane Grasslands Observed at Multiple Scales: Challenges, Caveats, and Opportunities	
Alison Donnelly	Characterizing temperate deciduous shrub and tree phenology	
Claudia-Helena Giraldo-Escobar	Recording phenological observations in Eucalyptus species: an approach to capturing intrinsically complex and entangled data	
Susanne Jochner-Oette	The network of the International Phenological Gardens of Europe – an update	

Human Biometeorology 3		VENTANA B
Chris Fuhrmann	Using a web-based tool to forecast local variations in wet bulb globe temperature	
Joseph Karanja	Thermal Discomfort for Unhoused Communities using different Tent Materials	
Milica Pecelj	Assessment of Outdoor Thermal Comfort in Belgrade (Serbia) During Marathon Performance	
Leonardo Brandão do Prado	Outdoor thermal discomfort: A case study of street vendors in the periphery of Rio de Janeiro	
Sam Chambers	Heat-Related Death as a Function of Physical Exertion and Border Policy in Southern Arizona	
Henno Havenga (VIRTUAL)	Healthy Environments for Athletes, a pilot study to understand environmental impacts on endurance athletes in South Africa.	

Climate and Society 5: Special Session on Heat Wave Ranking		VENTANA C
Greg Wellenius	Moderator	
Yuval Baharav	Why categorization? Impetus and worldwide implications	
Laurence S. Kalkstein	Heat wave categorization based upon human health outcomes: Results from year one pilot projects.	
Rebecca Rose	Pilot results for Seville categorization: evaluation	
Eleni Myrivili	Real-world application of a categorization system: utilization in Greece	
Peter Mitchell	How categorization is perceived by the general population	

Evening Meetings [5:00-6:00]

Climate and Health Commission

LA PAZ ROOM

WEDNESDAY, MAY 17

Morning Meetings [8:00-9:00]

Phenology Commission	VENTANA A
Animal Biometeorology Commission	VENTANA B
Special Workshop on Community Climate Observations for Health <i>Conveners: Jennifer Vanos, Arizona State University, and Hunter Jones, NOAA</i>	LA PAZ ROOM

Keynote Address [9:00-10:00]

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Veerasamy Sejian, Rajiv Gandhi Institute of Veterinary Education and Research
"Climate Change and Livestock Production: Current Scenario & Way Forward"

Break [10:00-10:30]

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Morning Parallel Sessions [10:30-12:00]

VENTANA ROOMS A, B, C

Plant Biometeorology 2		VENTANA A
Mark D Schwartz	Development of New Continental-Scale Spring Phenology Models	
Surendra Ranpal	Biotic and abiotic effects on pollen production of birch assessed in International Phenological Gardens of Europe	
Claudia-Helena Giraldo-Escobar	Integrating Eucalyptus into the Plant Phenology Ontology	
Theresa Crimmins	Volunteer-contributed observations of flowering show potential for characterizing airborne pollen concentrations	
Franck Koman	Agricultural Water Use and Climate Change: What Consequences for Land Resources	

Human Biometeorology 4 - including presentation of Tromp Award		VENTANA B
Loic Gillerot TROMP AWARD RECIPIENT	Forest structure and composition alleviate human thermal stress	
Oleh Skrynyk	CERRA-Thermal: A European gridded dataset of human thermal indices	
Pablo Fernandez de Arroyabe	Atmosphere electricity and human biometeorology: challenges and preliminary outcomes	
Stevan Savic	The 'network of networks' concept for better data usability and assessment of microclimate conditions – the FAIRNESS Action	
Niels Döscher	Bioclimate Analog Cities - Identification of climate analog regions based on bioclimatic indices derived from CORDEX data	

Animal Biometeorology 1		VENTANA C
Sheila Tavares Nascimento	Artificial shading alternatives for dairy cows	
Vinicius Fonseca	Shading plus sprinkler as alternative to mitigate heat stress of dairy goats in an equatorial semi-arid environment	
Angela Lees	Evaluating the heat load alleviation strategies of sheep feedlots in the Middle East	
John Gaughan	Investigation of new approaches to cooling cows experiencing increased heat load	
Tomilola Ayo Arilekolasi	Dietary manipulations using <i>Cajanus cajan</i> for improved ruminant production in a climate-resilient environment	

**Lunch and Poster Viewing [12:00-1:30]
& ISB Informational Meeting [begins at 12:15]**

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Enjoy your lunch while learning about what the International Society of Biometeorology has been up to, and where the Society is headed.

Early Afternoon Parallel Sessions [1:30-3:00]

VENTANA ROOMS A, B, C

Plant Biometeorology 3		VENTANA A
Tanja Cegnar	Effective communication of agrometeorological services	
Liang Liang	Calibrating Spring Index Model for More Geographically Accurate and Locally Relevant Predictions	
Frank-Michael Chmielewski	A physiological model for cherry blossom	
Georgia Kahlenberg	Influence of meteorology on airborne <i>Hymenoscyphus fraxineus</i> spore concentrations	
Simrat Singh	Biometeorological influence on the phenology of Yellow Bells (<i>Tecoma stans</i> L.) and implications on reproductive success	
Lumnesh Swaroop Kumar Joseph (VIRTUAL)	Climate change: future levels of elevated CO ₂ , warming and drought will change phenology of mountain grasslands	

Animal Biometeorology 2		VENTANA B
Nicola Lacetera	Creation of a first Italian climate database for the national livestock sector use: the case of Livestock Environment Opendata Project	
Angela Lees	The behavioural benefits of providing feedlot cattle with shelter structures during a temperate Australian Summer	
Vinicius Fonseca	Modelling evaporative water loss in goats	
Silpa Mullakkalparambil Velayudhan (VIRTUAL)	Assessing The Influence of Heat Stress on Caprine Skin: Unravelling The Impact of Epigenetic Alteration Due to Heat Stress at The Functional Level	

Human Health and Epidemiology 4		VENTANA C
Robert Davis	Associations between Synoptic Weather Types and Self-Reported Sinus Symptoms	
Andreas Matzarakis	Weather Sensitivity Surveys in Germany	
Eduardo Kruger	Feasibility of using ERA5-HEAT UHCI data as a proxy for missing field data in outdoor thermal comfort surveys and in the context of hospital admissions for respiratory diseases	
Luis B. Lecha Estela (VIRTUAL)	Impacts of extreme meteor-tropic effects on daily excess mortality in Cuba	

Break & poster take-down opportunity [3:00-3:30]

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Keynote Address and Closing Ceremony [3:30-4:30]

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Theresa Crimmins, University of Arizona

“The early bird and the worm: what can we learn from very early springs?”

Scott Sheridan, President, International Society of Biometeorology

Congress Dinner and Celebration at Desert Botanical Garden [6:00-10:00]

Bus transportation provided from ASU and Tempe; see details in General Information

Poster Guide

Numbering scheme:

Animal Biometeorology 101-105	Climate and Society 201-210	Human Health and Epidemiology 301-303
Human Biometeorology 401-415	Plant Biometeorology 501-509	Urban Biometeorology 601-612

Animal Biometeorology Posters

ID	Title	Presenting Author
101	Evidences for thermophysiological and physiochemical adaptability of desert goats (<i>Capra aegagrus hircus</i>) subjected to stressful conditions	Samara, Emad
102	Thermal comfort thresholds for broiler chickens based on performance and physiological responses	Nascimento, Sheila
103	Shape factor and body orientation to sun of Holstein cows raised in a tropical equatorial environment	Fonseca, Vinicius
104	Carbon footprint of Italian buffalo milk evaluated at farm gate	Lacetera, Nicola
105	Occupy ToadStreet: Occupancy and Habitat Use of the Arizona Toad in Streams of Arizona	Montgomery, Brett

Climate and Society Posters

ID	Title	Presenting Author
201	Evaluation of heat wave Predictability skills of Numerical Weather Models.	Akinbobola, Ademola
202	Heat related mortality and morbidity as public health issues: Understanding effectivity of existing Climate Action Plans in South Asia	Banerjee, Shreya
203	Estimation of summer heat stress in Balkan's Urban Environments	Pecelj, Milica
204	Serious games as a toolkit for understanding the need to adaptation to climate change in the neighborhoods.	Kuchcik, Magdalena
205	Development of a Spatial Synoptic Classification Scheme for East Africa with a Focus on Kenya	Alaso, Daniella
206	CoSynHealth – Developing climate services for future urban health based on an urban system approach	Hoffmann, Peter
207	Climate information for Mostar travel destination (Bosnia and Herzegovina) - Bioclimatological postcard	Pecelj, Milica
208	Exploring Air Quality in South Phoenix with Low-cost Sensors and Data Visualizations.	Nair, Nethra Sunder
209	Spatiotemporal patterns of heat vulnerability in Reno city, Nevada, United States between 2000 and 2022	Macharia, Consolata
210	Heat response planning and strategies in Phoenix, Arizona	Litwin, Michelle

Human Health and Epidemiology Posters

ID	Title	Presenting Author
301	The impact of weather types on elderly mortality during heat waves in Brazil	Teixeira Gonçalves, Fabio Luiz
302	The Human Costs of Extreme Heat Events: An Analysis Using Los Angeles County's Integrated Data Base	Sturm, Roland
303	Disease Associations to Heat Mortality in Virginia, 2005–2020	Roney, Patrick

Human Biometeorology Posters

ID	Title	Presenting Author
401	Gravity, Gravitational Acceleration & Geomagnetic Field Frequency Behavior: The Ever-Changing Geomagnetic Field	Parks, Peter
402	Gravity, Gravitational Acceleration & Geomagnetic Field Behavior: A Low-Tech Magnetic Frequency Generator: Demonstration of Concept	Parks, Peter
403	Gravity & Geo-magneto-electric Polarization of Air Gas Molecules	Parks, Peter
404	Spatial and Empirical Evaluation of Human Thermal Comfort Index using three different Empirical Methods over Nigeria	Akinbobola, Ademola
405	A Weather-Based estimation Model of Malaria Prevalence in Akure and Lagos South West, Nigeria	Akinbobola, Ademola
406	Development and validation of an integrated thermal sensation scale for the assessment of thermal state during whole-body water immersion: A pilot study	Ntoumani, Maria
407	Outdoor thermal comfort in urban green space during summer in humid subtropical climate: Chandigarh, India.	Suneja, Manavvi
408	A comprehensive clothing model to simulate the heat transfer in skin-clothing-environment system	Joshi, Ankit
409	Cell phone based application for exploring thermal perception in urban areas: case of Prague-Holešovice district	Lehnert, Michal
410	Seasonality related differences in cognitive responses of patients with coronary artery disease	Martinaitiene, Dalia
411	Simple and cost-effective setup for quantifying convective correction for mean radiant temperature measurements using cylindrical radiation thermometers	Rykaczewski, Konrad
412	Outdoor Mister Systems' Water Usage and Cooling Effectiveness	Johnson, Trevor
413	Sensitivity Analyses of Instruments for Microclimatic Measurements to Observe Park Cool Island in Tropical Climates: A Case Study in Singapore	Yik, Sin Kang
414	Performance evaluation of ENVI-met for seasonality in a tropical urban medium-sized park	Ching, Graces
415	Residents' summertime thermal perception in diverse urban parks in Warsaw, Poland	Lindner-Cendrowska, Katarzyna

Plant Biometeorology Posters

ID	Title	Presenting Author
501	Detecting changes in aspen phenology due to variations in environmental conditions in SE Wyoming	Sivanpillai, Ramesh
502	Effects of urbanisation, temperature and air pollutants on pollen production of three allergenic species	Jetschni, Johanna
503	Effects of water and energy balance on net ecosystem exchange of sweet cherry orchard	Tharaga, Phumudzo Charles
504	Studying the reproductive phenology of two sympatric Eucalyptus species to support the conservation of the endangered Red-tailed Black Cockatoo of Southeastern Australia.	Giraldo-Escobar, Claudia-Helena
505	Influence of agricultural drought, which occurred in the presence of the "El Niño" phenomenon, on bean yields.	Mejías Sedeño, Eva
506	Phenological shifts across the seasons in South Africa: records from traditional and social media	Fitchett, Jennifer
507	PEP725, the European phenological database	Hans, Ressler
508	Towards a Phenological Index for Australia	Keatley, Marie
509	Heliocaminiform structures: Plant organs that function as microgreenhouses	Coates, Charlotte

Urban Biometeorology Posters

ID	Title	Presenting Author
601	Tree Canopy Change Detection in Phoenix, Arizona (2014-2020)	Wright, Mary
602	Urban Adaptation Index of Brazilian Capitals	Teixeira Gonçalves, Fabio Luiz
603	Contributions of Roads to Surface Temperature: Evidence from Southern California	Engel, Ruth
604	The effects of 2-D and 3-D urban landscape metrics on mean radiant temperature in hot-arid Tempe, Arizona, USA	Cilek, Ahmet
605	Modeling the extent of park cool island on park size influence using ENVI-met: A Case Study of Singapore	Ho, Xiang Tian
606	Urban Bioclimatic Conditions and Potential Health Risks: a report from a Hot-Humid Tropical City	Balogun, Ifeoluwa
607	Reflective Pavements as an Urban Heat Mitigation Strategy: What is still to be understood?	Van Tol, Zachary
608	Meet Singapore MaRTy (SMaRTy): Biometeorological measurements in a tropical rainforest climate	Pek, Rachel
609	Analysing impacts of urban morphological variables and density on outdoor microclimate for tropical cities: A review and a framework proposal for future research directions	Ho, Beatrice
610	Human thermal sensation by local climate zones	Park, Sookuk
611	The influence of the type of green spaces in urban parks on soil temperature	Słowińska, Sandra
612	Using microclimate sensations and PET to assess outdoor thermal comfort ranges: A case study of Singapore's urban green space	Heng, Su Li