Urban Climate News

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From the IAUC President

Dear members of the IAUC community. These are sad and extraordinary times. How quickly things can change – three months ago at the time of the last IAUC Urban Climate News there was no inkling of the COVID-19 pandemic currently sweeping the world. In particular my thoughts are currently with friends and colleagues in the USA and Europe, but other regions are following similar paths of infection.

I imagine that most of us are now working from home, with our universities and research institutions closed to us. Those of us in the university sector have had to rapidly transfer to online teaching. For those of us in Australia, this corresponded with the beginning of the academic year, but for many this difficult transition would have occurred during the teaching semester. I wonder where we would be without the digital technology that we all embrace (but sometimes curse) that has enabled important research work and collaborations to continue. However important workshops and conferences for face-to-face interaction of our community, such as EGU, have been cancelled, postponed or transferred to an online format, and at least two IAUC-sponsored workshops/summer schools have been postponed until later in the year.

On a more positive note the IAUC Board and I are delighted to announce The Timothy Oke Award, a new IAUC research excellence award for early- to mid-career scientists in our field. Established in honour of our most esteemed colleague Tim Oke, this award will allow us to recognise the research excellence of younger colleagues at a critical part of their career. Of course, the Luke Howard Award for more senior members of our community remains, and this newsletter also calls for nominations for that award for 2020.

Inside the March issue...

At difficult times like this it is good to at least in part focus on the post-pandemic future and opportunities/activities for our community. This newsletter contains an update on ICUC-11, and a timeline of important dates leading up to our conference in Sydney, Australia in August 2021. The issue also contains its usual excellent selection of features and special reports, thanks to the hard work of David Pearlmutter, Paul Alexander, Helen Ward, Joe McFadden and Matthias Demuzere.

I hope that you and your families stay safe and healthy.

– Nigel Tapper,
IAUC President
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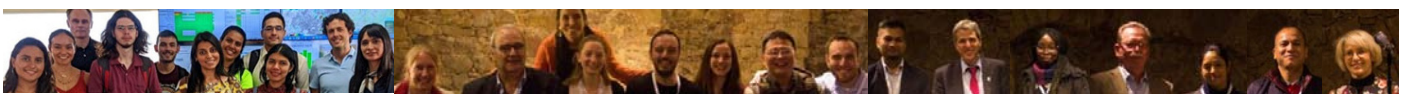


People walk in an empty street during a lockdown against the spread of COVID-19 in Milan, Italy. (www.dailymail.co.uk)

As the shutdown to tackle the coronavirus pandemic disrupts work and travel, cities see significant drops in air pollution – and during Earth Hour, many switch off their lights to highlight climate change

March 2020 — Famous buildings and structures switched off their lights to highlight climate change during Earth Hour, plunging landmarks in London, Moscow and Beijing into complete darkness. The blackout [on the eveneing of March 28th] was part of an international event organised by WWF to urge action to save the planet.

Andy Ridley, who was one of the driving forces behind Earth Hour when it began in Sydney, Australia, in 2007, said the world has the chance to do something positive for the planet even during this current crisis.

Due to the coronavirus pandemic, the WWF said it is not organising public gatherings - instead, supporters are encouraged to join in with online events.

Mr Ridley, speaking in an interview with Steven Day, the co-founder of renewable energy provider Pure Planet, said that 'the one thing we should be taking out of this is we have the capacity to act if we decide we are going to'. He added that there is a 'power of action when you get a mass engagement'.

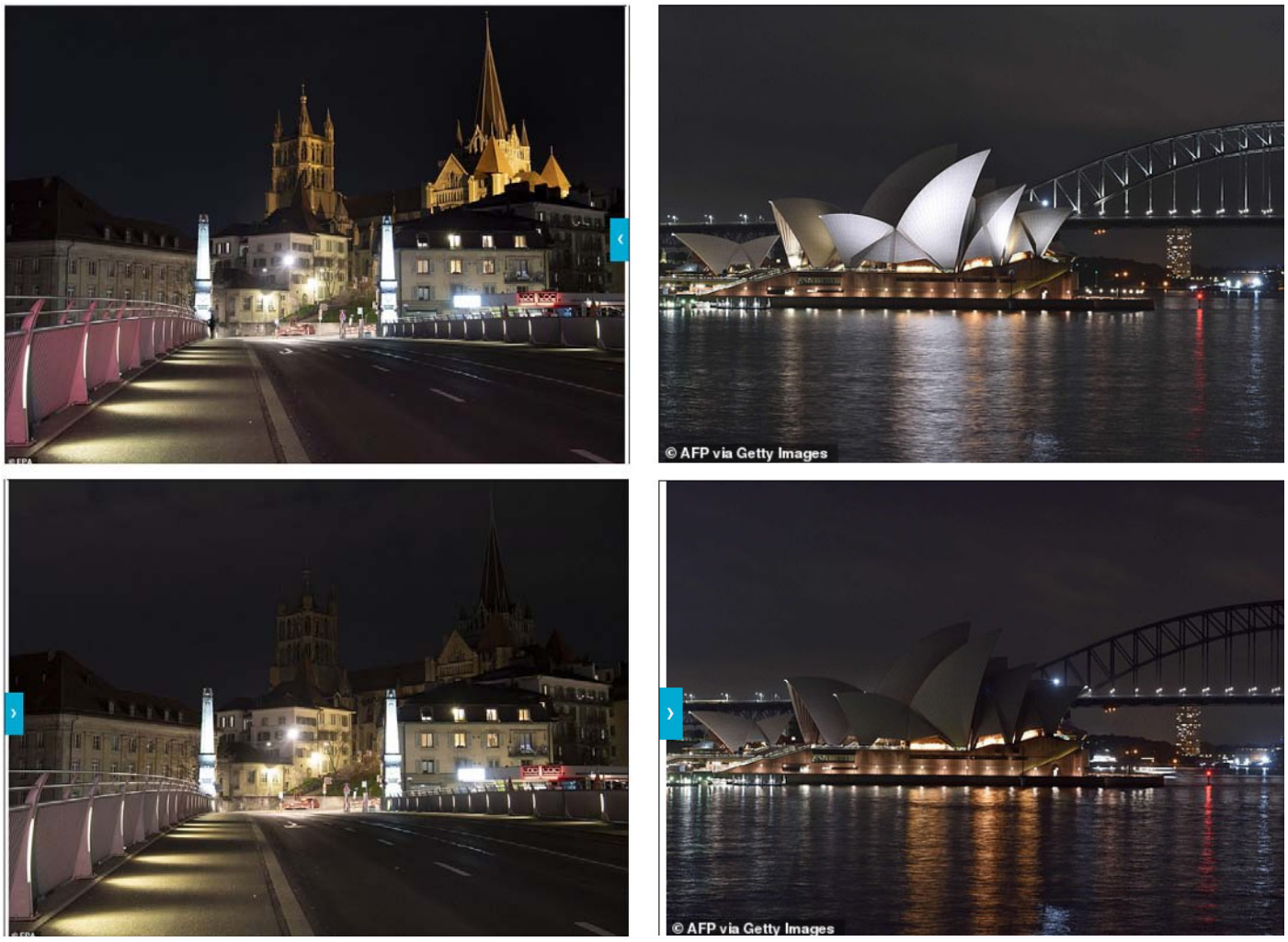
Mr Ridley also said that the world's current battle with coronavirus 'does clearly show the capacity for us to deal with things' and he advised anyone who may no longer be able to get outside that 'the biggest thing' is to 'remember how good it is to be out and how worth it that is.'

"...if governments decide to do something, then we can do something. The excuse has always been it's too hard, but we have just proven it isn't too hard."

It comes as some UK cities have seen significant drops in air pollution as the shutdown to tackle the coronavirus pandemic disrupts work and travel, analysis suggests.

Assessment of data from roadside monitoring sites in York, Birmingham, Glasgow, London and Manchester has revealed reductions in key pollutants nitrogen dioxide and tiny particles known as 'PM2.5'.

He also said in the interview: 'Greta (Thunberg, the teenage environmental campaigner) was right when she said if governments decide to do something then we can do something. The excuse has always been it's



Left: Two views of Lausanne's Cathedral with its illumination lights switched on (top) and off (bottom) and behind an empty street during the world's largest environmental and climate protection campaign 'Earth Hour' and a state of emergency due to the coronavirus disease (COVID-19) outbreak, in Lausanne, Switzerland. Right: The Sydney Harbour Bridge and the Opera House seen before (top) and after (bottom) being plunged into darkness for the Earth Hour environmental campaign on March 28, 2020. *Source:* www.dailymail.co.uk

too hard, but we have just proven it isn't too hard. So what happens at the end of this, how do we rethink what's going on?'

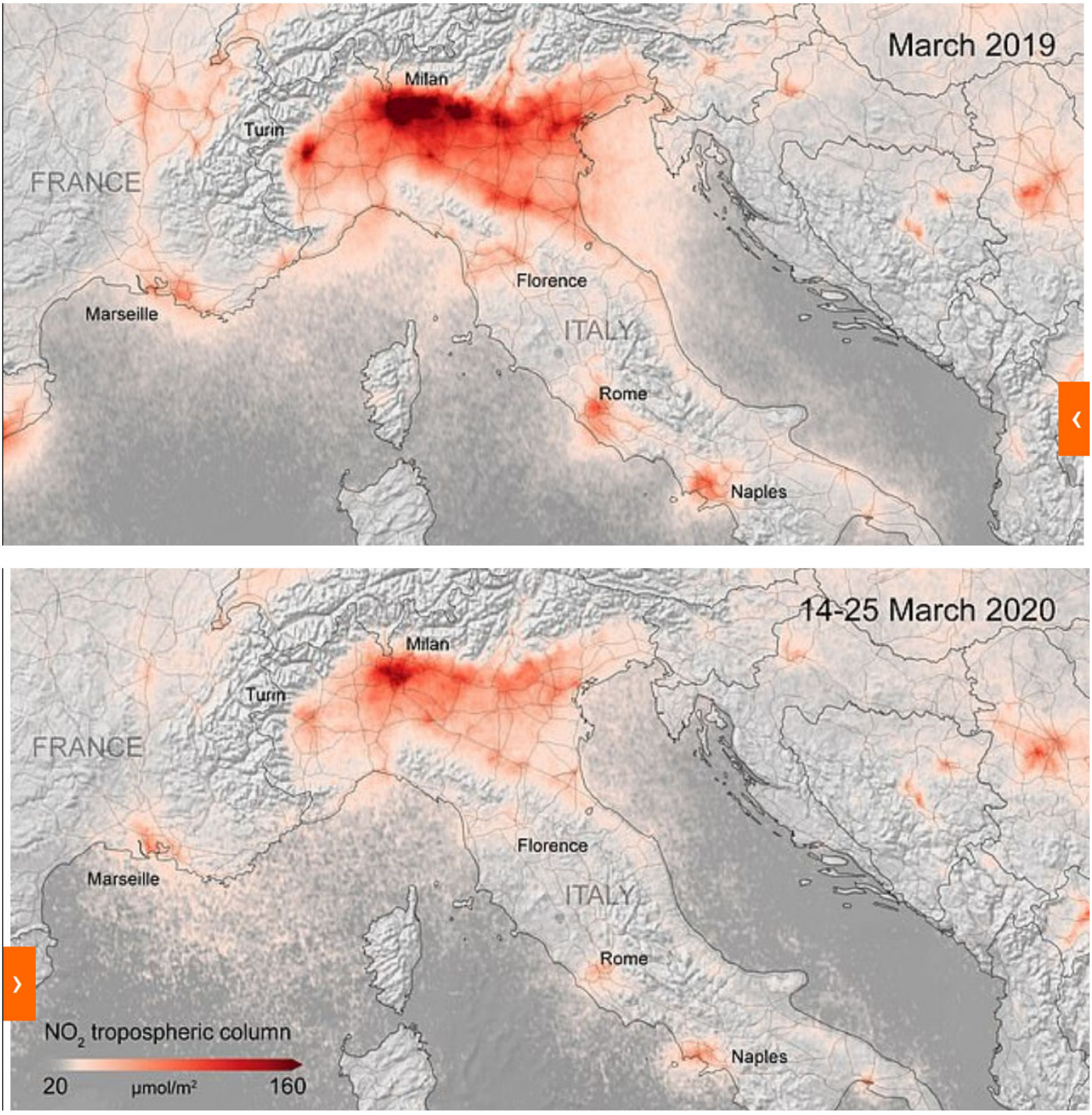
A number of landmarks across England were expected to take part in the grassroots movement, including London's The Shard, Blackpool Tower and Old Trafford in Manchester. The annual hour of darkness aims to highlight the impact humans are having on the planet through climate change, pollution, plastic and food production.

Katie White, executive director of advocacy and campaigns at WWF-UK, said: 'These are really unprecedented times, and I know a lot of people are looking for ways to connect and feel connected. In this global health crisis, now is a pivotal time for us to work together to safeguard our future and the future of our planet.' Bristol's Clifton Suspension Bridge [went] dark, while London hotspots like Piccadilly Circus and Covent Garden - which [were] deserted in the previous week due to the Covid-19 outbreak - were also expected to take part.

More than 7,000 cities in some 170 countries were estimated to have taken part last year. WWF was also encouraging supporters to join in online by tagging £EarthHour, while the organisation said it was running a series of virtual events - such as a silent disco and a Facebook quiz.

Ms White said: 'While - first and foremost - our thoughts are with those affected by coronavirus, and those who are working so hard in healthcare and other vital services, many millions of us are working and operating from our homes. Taking part in Earth Hour this year feels very timely - a time when millions unite around the world to show they care about the future of our planet. In these difficult times, it's an opportunity to inspire hope.'

It comes as analysis by scientists from the University of York of data from the London Air Quality Network and UK Automatic Urban and Rural Network has shown that the pollutants had fallen to levels lower than the average of the past five years due to the coronavirus crisis.



The starkest change in NO2 levels can be seen over northern Italy - including Milan - where some of the highest numbers of coronavirus cases have hit. Concentrations shown in March 2019 (top) and 2020 (bottom). *Source:* www.dailymail.co.uk

Monitoring of European cities, many of which are in lockdown over the pandemic, by the European Environment Agency (EEA) also reveals large decreases in air pollution, particularly nitrogen dioxide. The reduction in nitrogen dioxide in UK and European cities is likely to be caused by lower levels of traffic, experts said. Sources of PM2.5 include road transport, industry and fuel burning.

Professor James Lee from the Department of Chemistry at York and the National Centre for Atmospheric Science (NCAS) said: 'These are the two air pollutants that have the biggest health impacts on people. From our analysis, pollution levels are clearly lower than the average of the previous five years. I would expect them to drop even further over the coming weeks. We will continue to analyse the data and potentially take in more sites to build a bigger, more accurate picture of the situation.'

The data will need to be carefully analysed to pinpoint the exact cause of the decline, the scientists warn, as many things can affect air pollution, including local weather, new regulations and human activity.

The change in atmospheric NO2 is particularly stark in Paris, Milan and Madrid (pictured). *Source:* www.dailymail.co.uk

Air pollution causes an estimated 40,000 early deaths in the UK each year. It is linked to health problems including stroke, heart disease, lung cancer and disease, and respiratory diseases and infections, as well as stunting the growth of children's lungs – though experts have warned that the health benefits of reduced air pollution and lower exposure as people stay off the streets and in their homes in the shutdown may not offset mortality from Covid-19 and health problems caused by isolation.

Data from local monitoring stations analysed by the EEA reveals big drops in nitrogen dioxide in some cities across Europe. In Milan, northern Italy, average concentrations of the pollutant over the past four weeks are at least 24% lower than over four weeks earlier this year.Rome's pollution levels over the past four weeks were 26-35 % lower than for the same weeks in 2019, the EEA said.

Cities in other European countries have also seen major reductions in nitrogen dioxide where lockdown measures have been implemented during the week of March 16-22. Barcelona's pollution levels fell 40% from one week to the next, and were down 55% compared to the same week in 2019, while Lisbon has seen a 41% drop in nitrogen dioxide week-on-week and is down 51% compared to the same week last year.

Hans Bruyninckx, EEA executive director, said: 'The EEA's data shows an accurate picture of the drop in air pollution, especially due to reduced traffic in cities. 'However, addressing long-term air quality problems requires ambitious policies and forward-looking investments. As such, the current crisis and its multiple impacts on our society work against what we are trying to achieve, which is a just and well-managed transition towards a resilient and sustainable society.'

Yesterday, satellite images from the European Space Agency showed a massive drop in air pollution levels across European cities due to coronavirus isolation measures. New data captured by the ESA Copernicus Sentinel-5P satellite shows a strong reduction in nitrogen dioxide concentrations over major European cities. The change in the amount of NO2 in the atmosphere is particularly stark in Paris, Milan and Madrid, according to the ESA.

The coronavirus has been spread around the world, and to combat this spread and ease demand on health services, countries have gone into lockdown. Copernicus has mapped air pollution levels across Europe since the outbreak of the virus and found a 'significant drop' coinciding with new lockdown measures. The satellite images show nitrogen dioxide concentrations from 14 to 25 March 2020, compared to the monthly average of concentrations from 2019.

Deserted London hotspots like Piccadilly Circus and Covent Garden also joined Earth Hour. *Source:* www.dailymail.co.uk

Henk Eskes, from KNMI, explains why these dates were chosen: 'The nitrogen dioxide concentrations vary from day to day due to changes in the weather. Conclusions cannot be drawn based on just one day of data alone. By combining data for a specific period of time, 10 days in this case, the meteorological variability partly averages out and we begin to see the impact of changes due to human activity,' Eskes said.

'The chemistry in our atmosphere is non-linear. Therefore, the percentage drop in concentrations may differ somewhat from the drop in emissions. Atmospheric chemistry models, which account for daily changes in weather, in combination with inverse modelling techniques are needed to quantify the emission based on the satellite observations.'

The latest images and data focus on Italy, Spain and France but they are working on studying data for parts of northern Europe including the UK and Netherlands. 'New measurements from this week will help to assess the changes in nitrogen dioxide over northwest Europe,' ESA said. The multi-national space agency did confirm that levels of the pollutants over London are significantly lower than in March 2019.

European Environment Agency (EEA) data shows that air pollutant concentrations in Rome and Milan have dropped by 50 per cent, while a Paris air quality monitoring agency recorded up to a 30% decline in pollution.

The KNMI team, in collaboration with scientists worldwide, have started to work on a more detailed analysis using ground data, weather data and inverse modelling to interpret the concentrations observed. They are using this data to estimate the influence of the shutdown measures. 'For quantitative estimates of the changes in the emissions due to transportation and industry, we need to combine the Tropomi data from the Copernicus Sentinel-5P satellite with models of atmospheric chemistry,' said Henk.

As daily life grinds to a halt in the UK due to restricted movement to control the spread of COVID-19, air quality has improved due to a sharp reduction in traffic. These promising early signs suggest air pollution could be falling across UK cities while the pandemic goes on. 'Air quality has started to improve in many UK cities, mirroring what has been seen in other countries that have restricted travel and levels of outdoor activity,' said Professor Alastair Lewis, from the National Centre for Atmospheric Science, University of York.

'This is primarily a consequence of lower traffic volumes, and some of the most clear reductions have been in nitrogen dioxide, which comes primarily from vehicle exhaust. However fine particles (PM2.5) have also reduced significantly. In London for example, PM2.5 is noticeably lower than would be expected for this time of year at the roadside, and these reductions stretch through into the suburbs as well.'

Professor Lewis said it's especially important to consider how PM2.5 levels have changed compared to what is normally seen at this time of year. 'Air pollution is noisy, changing with weather and so on,' he said. 'It's really best to compare where we are now against where we might have expected to be based on previous years.'

London Air Quality Network, a King's College London project, comprises more than 100 continuous monitoring sites in the majority of London's 33 boroughs. The data shows that PM2.5 levels in the capital are currently about half those seen on average from 2015 to 2019, as measured in micrograms (one-millionth of a gram) per cubic meter air (µg/m3). —By RYAN FAHEY. *Source:* https://www.dailymail.co.uk/news/article-8163673/Cities-globe-switch-lights-highlight-climate-change-Earth-Hour.html

The Pandemic Is Turning the Natural World Upside Down

Widespread social-distancing measures have produced some jarring effects across land, air, and sea [and in cities]

March 2020 — From inside her living room in London, Paula Koelemeijer can feel the world around her growing quieter.

Koelemeijer, a seismologist, has a miniature seismometer sitting on a concrete slab at the base of her first-floor fireplace. The apparatus, though smaller than a box of tissues, can sense all kinds of movement, from the rattle of trains on the tracks near Koelemeijer's home to the waves of earthquakes rolling in from afar. Since the United Kingdom announced stricter social-distancing rules last month, telling residents not to leave their home except for essential reasons, the seismometer has registered a sharp decrease in the vibrations produced by human activity.

With fewer trains, buses, and people pounding the pavement, the usual hum of public life has vanished, and so has its dependable rhythms: Before the spread of COVID-19 shut down the city, Koelemeijer could plot the seismometer's data and see the train schedule reflected in the spikes, down to the minute. Now, with fewer trains running, the spikes seem to come at random.

"It's very literally reflecting a slowdown of our lives," Koelemeijer told me over Skype.

Koelemeijer said she briefly geeked out over the recent data before reality set in. At first glance, this is indeed a fascinating observation, the kind of factoid that might appear on the underside of a Snapple cap. The "wow" moment is short-lived, of course, because the explanation is not a quirk of nature or some other benign eccentricity, but a catastrophic virus that has sickened and killed thousands, crumpled economies, and plunged public life into a fearful limbo with no easily discernible end.

But the response to the pandemic has unwittingly produced some other large-scale, though less conspicuous, effects. In a bittersweet twist, the surreal slowdown of life as we know it has presented researchers with a rare opportunity to study the modern world under some truly bizarre conditions, and they're scrambling to collect as much data as they can. Here are four ways the pandemic is being felt across land, air, and sea.

THERE'S LESS RUMBLING ON THE SURFACE

Seismologists around the world have noticed the same effect Koelemeijer detected in London, and at more traditional stations than a fireplace.

The trend started with Thomas Lecocq, a seismologist at the Royal Observatory of Belgium, in Brussels. Seismic stations are usually found well outside metropolitan areas, away from vibrations that could obscure subtle tremors within Earth's interior, but the Brussels station was established more than a century ago, before a city grew around it. Today, it provides a fascinating glimpse of the ebb and flow of a bustling city; Lecocq has found that when it snows, anthropogenic seismic activity decreases, and on the day of a road race, it spikes. Lecocq checked seismic data the day before Belgium began a

nationwide lockdown, and then the following morning. The drop in activity, he said, was "immediate." Right now, daytime in Brussels resembles Christmas Day.

Lecocq shared his approach online, and seismologists in the United States, France, New Zealand, and elsewhere are now seeing the effects of their country's own social-distancing measures on seismic activity. For seismologists who study seismic signals from Earth's interior—rather than other sources, including people, animals, even storms—quarantines seem to have made it easier to listen. "Normally we wouldn't pick up a 5.5 [magnitude earthquake] from the other side of the world, because it would be too noisy, but with less noise, our instrument is now able to pick up 5.5's with much nicer signals during the day," Koelemeijer said.

THERE'S LESS AIR POLLUTION

As cities and, in some cases, entire nations weather the pandemic under lockdown, Earth-observing satellites have detected a significant decrease in the concentration of a common air pollutant, nitrogen dioxide, which enters the atmosphere through emissions from cars, trucks, buses, and power plants. The drop, observed in China and Europe, coincided with stringent social-distancing measures on the ground. Air pollution can seriously damage human health, and the World Health Organization estimates that conditions stemming from exposure to ambient pollution—including stroke, heart disease, and respiratory illnesses—kill about 4.2 million people a year.

The cleaner air could lead to a brief respite in parts of the world with severe air pollution even as they battle the coronavirus. According to an analysis by Marshall Burke, a professor in Stanford's Earth-system science department, a pandemic-related reduction in particulate matter in the atmosphere—the deadliest form of air pollution—likely saved the lives of 4,000 young children and 73,000 elderly adults in China over two months this year.

"There's a quantifiable temporary benefit," Joseph Majkut, the director of climate policy at the Niskanen Center, in Washington, D.C., told me, referring to Burke's analysis. But—and it's an important "but"—"as we go about our recovery, I think we'll go back to business as usual," he said. A drop in emissions this year, including carbon dioxide, the pollutant that causes global warming, won't make a dent in the long-term effort to manage the climate crisis. "We're not solving climate change by having a global pandemic," Majkut said.

CITY SOUNDSCAPES ARE CHANGING

With so many people staying home—and public-transit agencies cutting service as a result—there's significantly less noise from cars, buses, trains, and other transportation. Erica Walker, a public-health researcher at Boston University, has taken a decibel meter with her on her socially distanced walks, and she has been stunned by the measurements. "It's a lot quieter," she told me.

Before the coronavirus pandemic, the acoustic environment in Kenmore Square, a busy intersection near campus, is usually about 90 decibels during rush hour. Yesterday, Walker's rush-hour readings were just under 68 decibels. (For comparison, a subway train rumbling past nearby registers at 95 decibels—the level at which chronic exposure could result in impaired hearing—and the sound of normal conversation is 60 to 70 decibels.) In some spots in the Fenway Park area, where Walker has studied noise pollution for several years through her program Noise and the City, her latest data show reductions close to 30 decibels. "It's unbelievably a huge difference," Walker said.

City dwellers might now be hearing sounds that can get muffled by the usual drone. Rebecca Franks, an American who lives in Wuhan, the epicenter of the coronavirus outbreak in China, made this observation 48 days into the city's quarantine last month: "I used to think there weren't really birds in Wuhan, because you rarely saw them and never heard them. I now know they were just muted and crowded out by the traffic and people," Franks wrote on Facebook. "All day long now I hear birds singing. It stops me in my tracks to hear the sound of their wings." Sylvia Poggioli, an NPR correspondent in Italy, reported that the streets of Rome are so empty, "you can actually hear the squeak of rusty door hinges," and "the chirping of birds, an early sign of spring, is almost too loud."

A quick search for the phrase birds are louder on Twitter reveals that many other people have been wondering the same thing I have lately: Are the birds chirping more fiercely these days, or am I losing my mind? With spring migration in full swing in the Northern Hemisphere, there are certainly more birds around. But the reduction in noise pollution—and, in some places, its total absence—might make it easier to notice the usual trilling and squawking.

Quieter conditions, perhaps for several months, might seem like a good thing; it's well established that noise pollution can negatively affect our health, contributing to stress-related ailments, high blood pressure, sleep disruption, and other problems. Any potential benefits are difficult to predict without more research, Walker said, and based on recent activity in the Noise and the City's app, where Bostonians can record neighborhood sounds and provide their own descriptions, people might respond to newfound quiet in different ways. For some residents, the new soundscape reminds them of the peacefulness of their childhood decades ago, when the city was less built up. For others, it's another source of pandemic-related stress—eerie, like the calm before a storm.

THE OCEANS ARE PROBABLY QUIETER, TOO

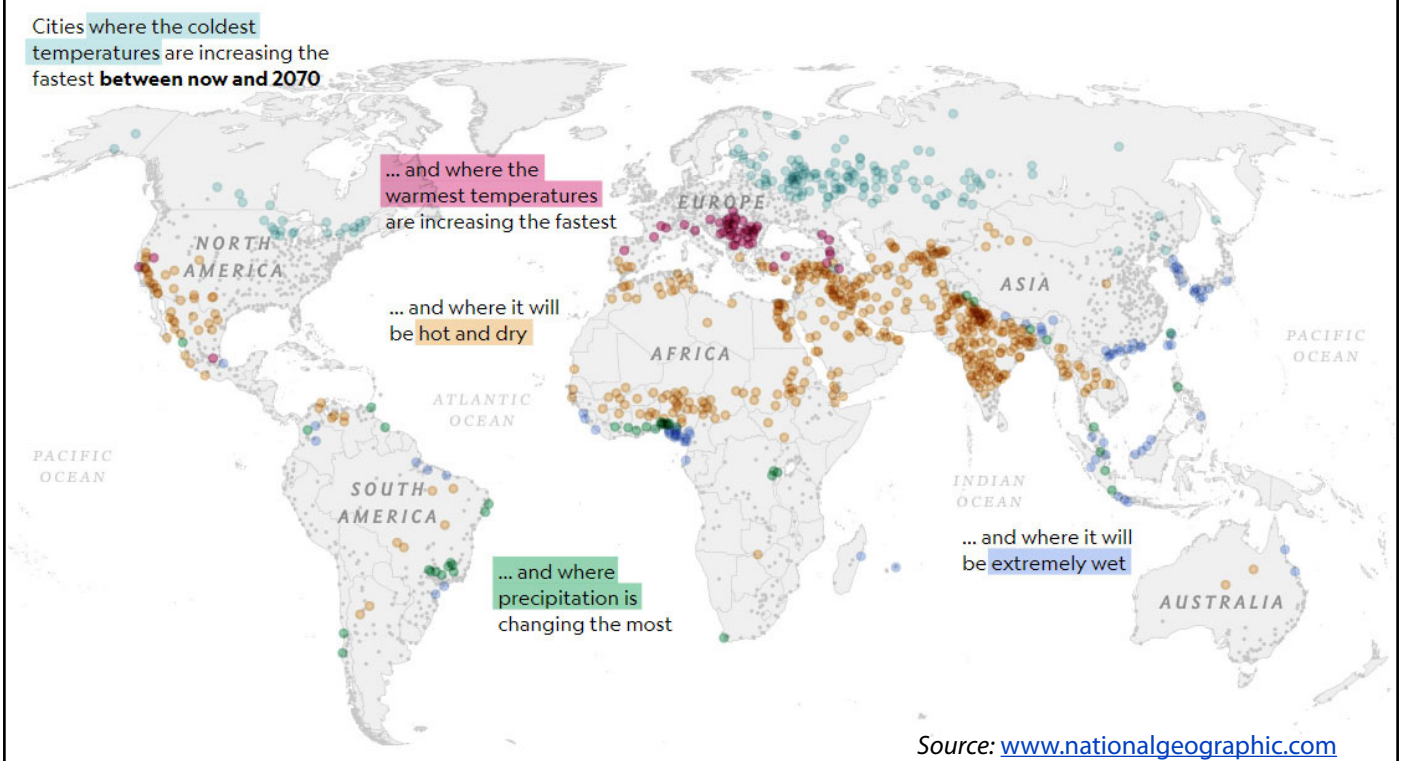
For other species, less noise pollution is no doubt welcome. Michelle Fournet, a marine ecologist at Cornell who studies acoustic environments, is hoping to position underwater microphones off the coast of Alaska and Florida, where she has studied humpback whales and other marine life, to investigate how the waters have changed in the absence of noise from cruise ships as the industry suspends operations worldwide.

"Just pulling those cruise ships out of the water is going to reduce the amount of global ocean noise almost instantaneously," Fournet told me. "We're experiencing an unprecedented pause in ocean noise that probably hasn't been experienced in decades."

Research has shown that ambient noise from ships and other maritime traffic can increase stress-hormone levels in marine creatures, which can affect their reproductive success. Whales have even shown they can adapt to the din, pausing their singing when cargo ships are near and resuming when they move away.

The unexpected ecological moment brought on by the pandemic reminds Fournet of an accidental experiment that unfolded in the days after 9/11, when ship traffic in North American waters ground to a halt. Researchers working in Canada's Bay of Fundy—already making recordings and taking samples before the terrorist attacks—eventually found that over the course of just a few days, when the noisy waters calmed, right whales in the bay experienced a drop in their stress-level hormones.

Fournet is thinking now of North Pacific humpback whales, who have begun to move northward this month and will soon be swimming with newborn calves in southeast Alaska, a region also popular with cruise ships for views of local wildlife. "This will be the quietest entry that humpback whales have had in southeastern Alaska in decades," Fournet said. "Nature is taking a breath when the rest of us are holding ours." —By MARINA KOREN. *Source:* https://www.theatlantic.com/science/archive/2020/04/coronavirus-pandemic-earth-pollution-noise/609316/



Source: www.nationalgeographic.com

See which cities will feel the brunt of climate change

The whole planet will feel climate change's impacts over coming decades. But some cities will see more dramatic changes than others. As part of its Earth Day 50th Anniversary Special Issue, *National Geographic* has offered both optimistic and pessimistic scenarios for life on earth in another 50 years from now. Included among the more dire projections is a series of eye-opening interactive graphics showing how temperature and precipitation patterns in many of the major urban areas of the world could change by 2070 if significant efforts to curb greenhouse gas emissions are not made quickly.

UHI in Beijing was reduced by half because of population migration during Chinese New Year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This article summarizes a recently published paper and related work:
Dou and Miao (2017) Impact of mass human migration during Chinese New Year on Beijing urban heat island. *International Journal of Climatology* 37: 4199-4210. DOI: 10.1002/joc.5061

Introduction

The Chinese New Year (CNY, also called Spring Festival or Lunar New Year) is the most important festival in China. People usually travel from big cities to their hometowns for family reunions for the CNY festival and go back to big cities for work or education after CNY. In recent years, the annual average flow of CNY passengers reached more than 3 billion across China. This mass human migration is characterized by its large magnitude, short duration and strong directionality.

The urban heat island (UHI) is one of the most significant meteorological impacts of urban areas, resulting from the altered daytime urban energy balance and heat storage (Oke 1982). At the same time, people release anthropogenic heat (AH) into the atmosphere, which becomes one of the important causes of the UHI (Ichinose et al. 1999). Studies have demonstrated the significant effects of AH on UHI; however, few observational studies address the extent of the AH influence on the UHI because of the difficulty of isolating the AH effects in observations.

As a megacity, Beijing experiences fierce urbanization and a strong UHI (Wang and Hu, 2006). Beijing also attracts lots people who leave their household for better work opportunities and education, creating a large floating population. A previous study showed that 1.760 million people migrated out of Beijing before CNY in 2014 (Wang et al., 2014). The population reduced so sharply that Beijing was called "an empty city" (http://en.people.cn/90882/8525583.html). This population movement around the CNY in Beijing provides an ideal opportunity to analyze the impact of such a major human activity on the intensity of the UHI.

Data and Method

The CNY date, the first day of a Chinese lunar year, shifts annually among days in January and February based on the lunar calendar. The CNY holiday officially lasts for 7 days, which is called CNY week in this study. The average daily 2-m temperature in the study area (figure not shown) indicates a sharp rise after CNY weeks because the season begins to change from winter to spring. To avoid the season change impact, 3 weeks in winter before the CNY are used as the background period. Migration mainly occurrs during the week before CNY (Wang et al., 2014); thus the pre-CNY period is defined as 2-4 weeks before CNY week.

Hourly observations from 124 automatic weather stations (AWSs) from 2010 to 2015 across our study area were used (Fig. 1). Distances between the AWS sites average 3 and 5 km in the urban and rural areas, respectively. The AWS data were quality controlled based on the technique of Dou et al. (2014). Eight typical rural stations (presented in Fig. 1) were selected following the method in Dou et al. (2015). Highly populated areas are mainly located within the 4th Ring Road (RR) (shown in Fig. 1), and the population is relatively sparse outside of this road (Kuang et al. 2011). All urban AWSs within the 4th RR (26 stations) were selected as typical urban stations in this study.

Daily maximum (T_{max}), minimum (T_{min}) and average (T_{ave}) 2-m air temperatures were used to calculate the temporal and spatial distributions of the UHI intensity. T_{max} (T_{min}) is defined as the highest (lowest) hourly temperature per day from 00 to 23 local standard time (LST), and T_{ave} was defined as the average temperature throughout the day from 00 to 23 LST. The urban heat

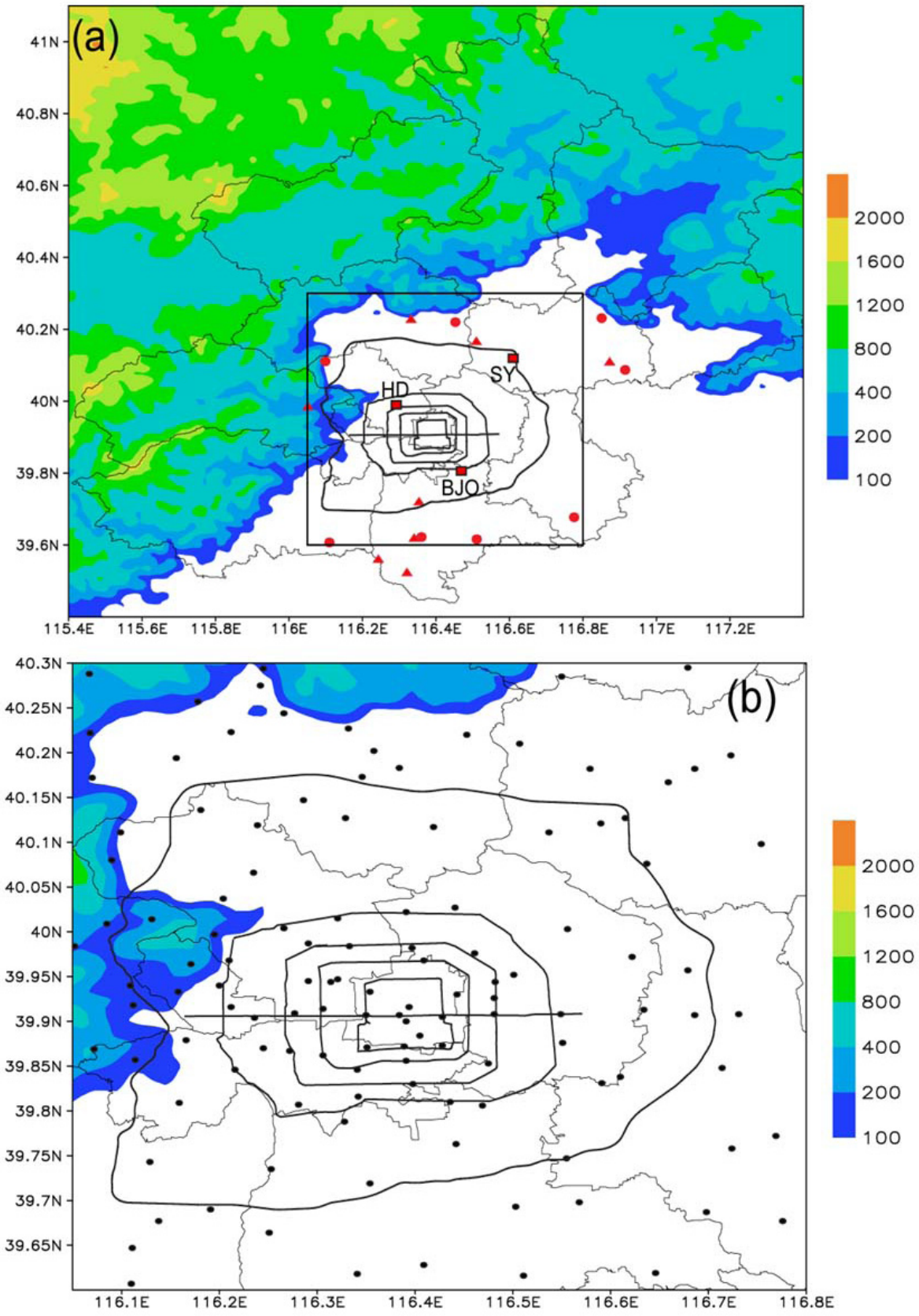

Figure 1. Beijing topographical distribution (shading, unit: m) for Beijing municipality (a) and the study area (b) represented by the black square in (a). Black lines represent the Beijing 2nd-6th Ring Roads, black dots represent AWS stations, red dots represent rural stations, red triangles represent soil moisture sites, and red rectangles represent cloud cover sites: HD, SY and BJO are short for Haidian, Shunyi and Beijing Observatory, respectively.

island intensity (UHII) was defined as follows:

$$UHII = T_{urban} - T_{rural}$$

where T_{urban} is the average temperature (T_{max}, T_{min} or T_{ave}) of the 26 urban stations and the corresponding T_{rural} is the average temperature of the 8 rural stations. UHIIs for daily maximum ($UHII_{tmax}$), minimum ($UHII_{tmin}$) and average ($UHII_{tave}$) temperatures were analyzed in this study.

Meteorological factors, including precipitation, rural wind speed, soil moisture and cloud cover are checked because of their significant effects on the UHI (Klysik and Fortuniak, 1999; Stewart, 2011; Georgescu, 2012): (1) rainy days were excluded; (2) average 10-m wind speed at the 8 rural sites shows that rural wind speed changed little during the pre-CNY period and CNY week (1.71 vs 1.75 m/s); (3) hourly volumetric soil water content of the top level of the soil (0-10 cm depth) at 8 rural sites (Fig. 2) varied little between the pre-CNY period and CNY week (7.77 vs. 7.76 g/cm^3); and (4) the average total cloud cover at three stations around Beijing (Beijing Observatory Station, Haidian Station and Shunyi Station, shown in Fig. 2) during the pre-CNY period and CNY week are both 3.7. These findings indicate the negligible impact of wind speed, soil moisture and cloud cover on the difference in UHI between the pre-CNY period and CNY week.

Results

$UHII_{tmax}$ during the study period varies between 0.04 and 1.19 °C and decreased notably during CNY week (Fig. 2a), with an average $UHII_{tmax}$ of 0.60 °C and 0.27 °C before and during CNY week, respectively. A similar phenomenon is observed in $UHII_{tave}$ (Fig. 2b), but the decrease rate is much smaller than $UHII_{tmax}$ (14% vs. 55%). $UHII_{tmin}$ indicates no clear trend during the study period.

Diurnal variation in UHII during the pre-CNY period and CNY week (Fig 3) shows smaller UHII during CNY week than during the pre-CNY period. The difference of UHII between the pre-CNY period and CNY week is greater in daytime (9:00-19:00 LST) than in nighttime. Two peaks occurred at 10:00 LST (1.04 °C) and 18:00-19:00 LST, both busy hours in workdays during the pre-CNY period when thousands of people commute. This two-peak pattern of the CNY difference has good agreement with the estimated traffic AH fluxes for Beijing in Tong et al. (2004).

The spatial distribution of $UHII_{tmax}$ (referring here to T_{max} at each station minus T_{rural}) during CNY week, minus those during the pre-CNY period, is shown in Fig. 4a. $UHII_{tmax}$ shows negative values across the city. The greatest $UHII_{tmax}$ decrease during CNY week is observed between the 3rd and 4th RRs, 80.0% lower than during the pre-CNY period. The $UHII_{tave}$ difference between CNY week and the pre-CNY period distribution is similar to $UHII_{tmin}$.

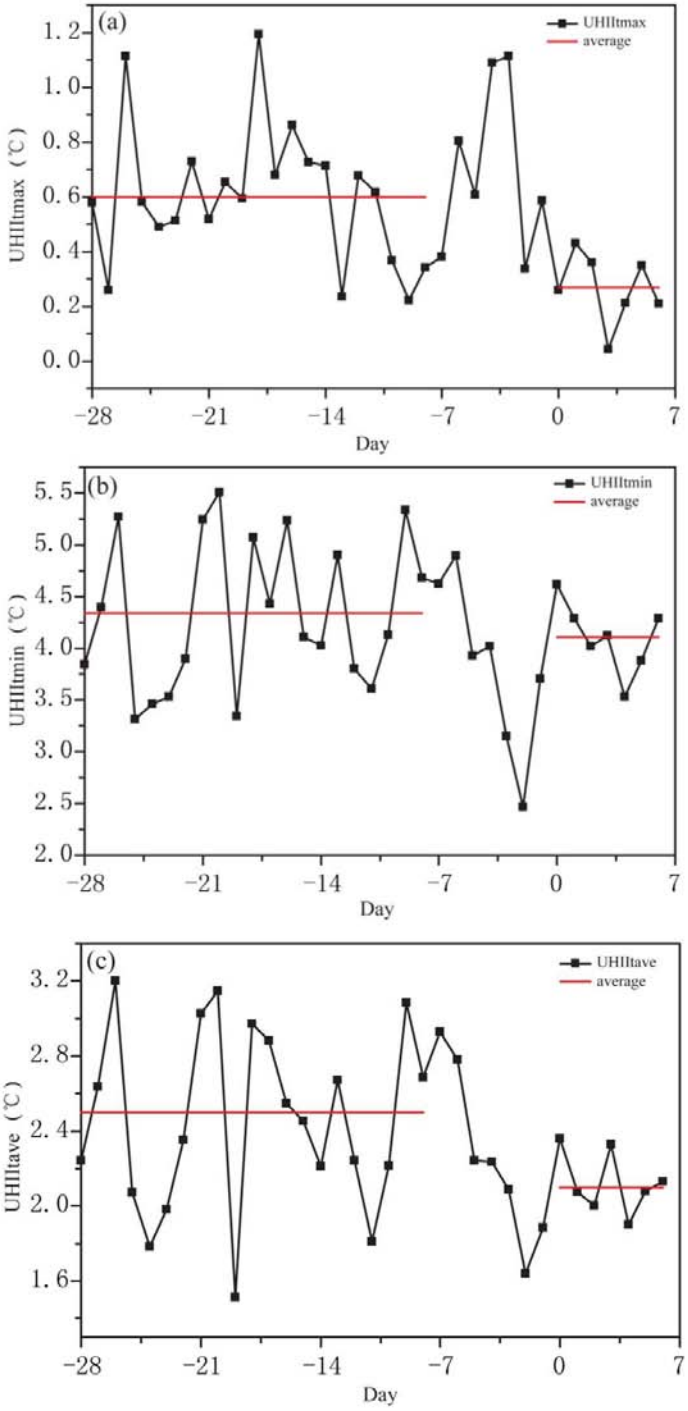

Figure 2. Temporal variation of (a) $UHII_{tmax}$, (b) $UHII_{tmin}$, and (c) $UHII_{tave}$ during 2010 to 2015; red lines represent average values.

Conclusion

Nearly half of Beijing's population has been estimated to leave the city during the CNY holiday in recent years. AH emissions decrease with decreasing population, and the UHII weakens. In this study, the $UHII_{tmax}$

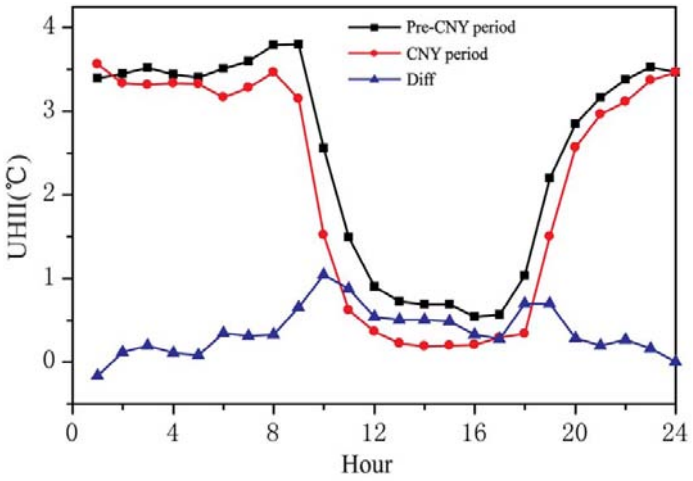

Figure 3. Diurnal variation of UHII during the pre-CNY period (black line), CNY week (red line), and the difference between CNY week and the pre-CNY period (blue line).

inside the 4th RR during CNY week decreased by 55% compared with that of the pre-CNY period, which is significant at the 99% confidence level by a t-test. $UHII_{tmin}$ during CNY week only decreased by 5% compared to the pre-CNY period. A conclusion can be drawn that mass migration has remarkable effects on T_{max} but not on T_{min}.

Anthropogenic heat sources primarily include the three classically defined sectors of the economy that consume energy: transportation, buildings, and industry. A fourth, less important source is the heat from human metabolism (Sailor, 2010). Due to the growing emphasis on environmental protection in Beijing, enterprises have been moved out of the city. The AH reduction caused by migration during CNY week is mainly caused by a reduction in vehicle and building energy consumption (e.g., lighting, electrical appliances, gas, and so on). Statistics indicate that the AH emissions from traffic mainly occur during the day in Beijing (Tong et al., 2004). Therefore, migration has a significant effect on T_{max} during the day but has less influence on T_{min} at night. The mechanism of migration impact on UHII is presented in Fig. 5. This study can provide suggestions for optimizing the layout of urban land-use structures and help for resilient cities.

Acknowledgments

This work was funded by the National Natural Science Foundation of China (41605012), Beijing Municipal Science and Technology Commission (Z151100002115045) and the Ministry of Science and Technology of China (2015DFA20870). The authors sincerely appreciate Drs. Lingyun Wu and Jingyong Zhang from the Institute of Atmospheric Physics, Chinese Academy of Sciences for their in depth and valuable suggestions.

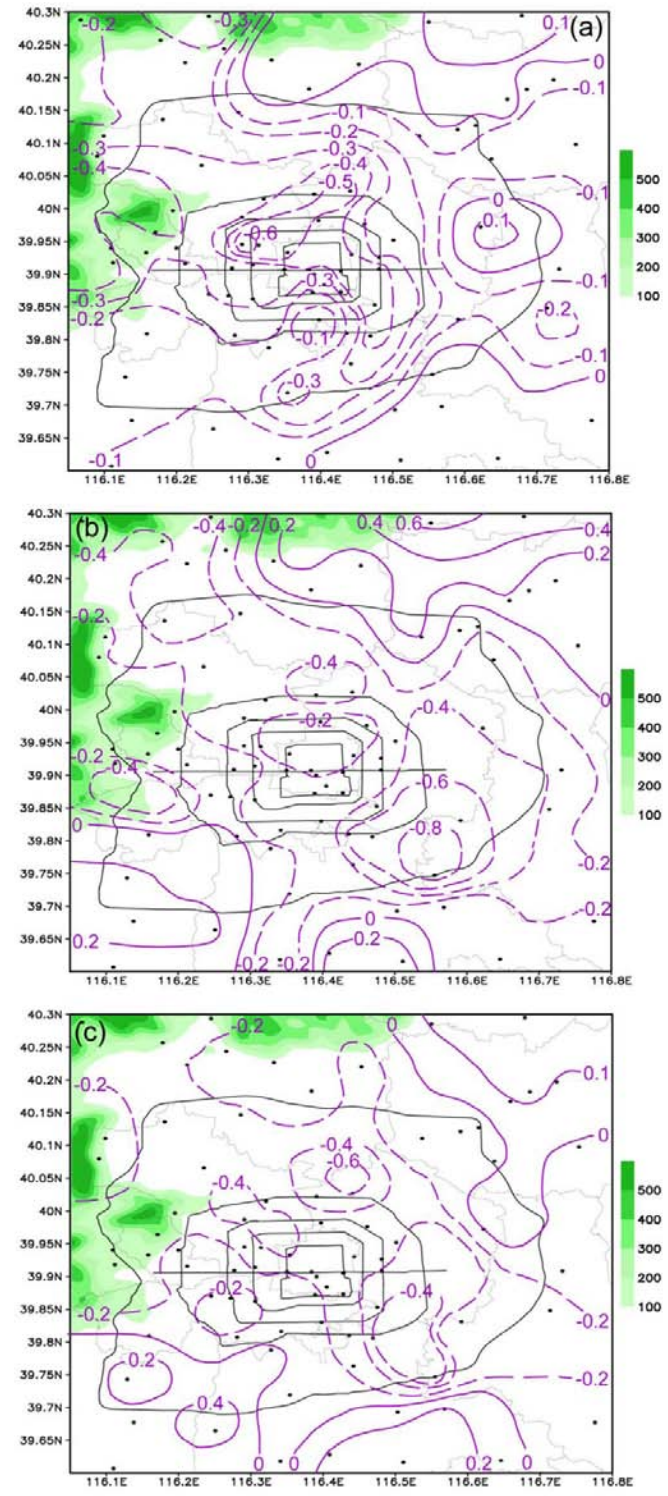

Figure 4. Spatial distribution of the differences between CNY week and the pre-CNY period for (a) $UHII_{tmax}$, (b) $UHII_{tmin}$, and (c) $UHII_{tave}$ respectively (unit: °C). Black lines indicate the Beijing Ring Roads, and green shading indicates topography (unit: m).

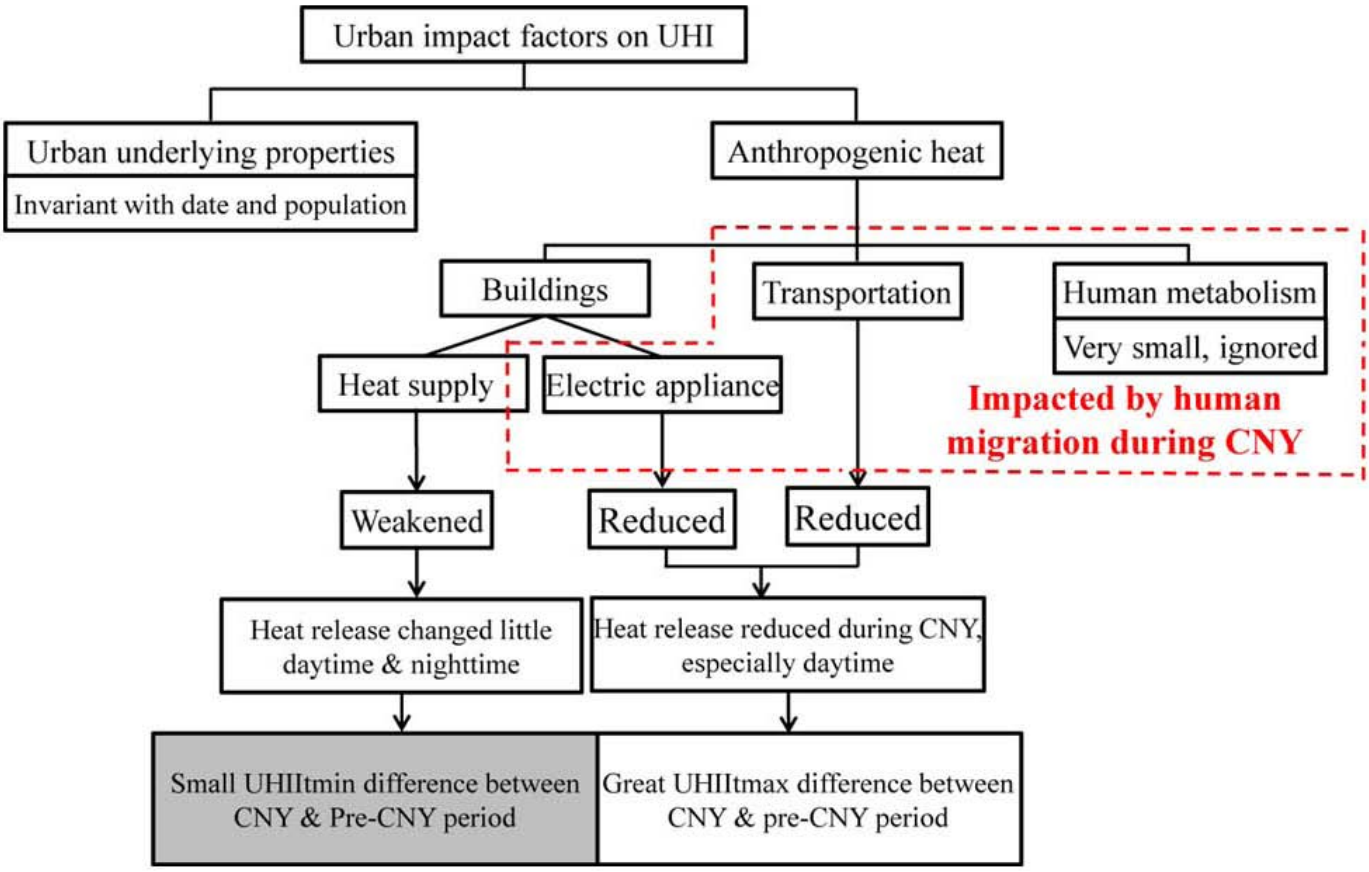

Figure 5. Flowchart showing the impact of mass human migration on UHII during the pre-CNY period and CNY week.

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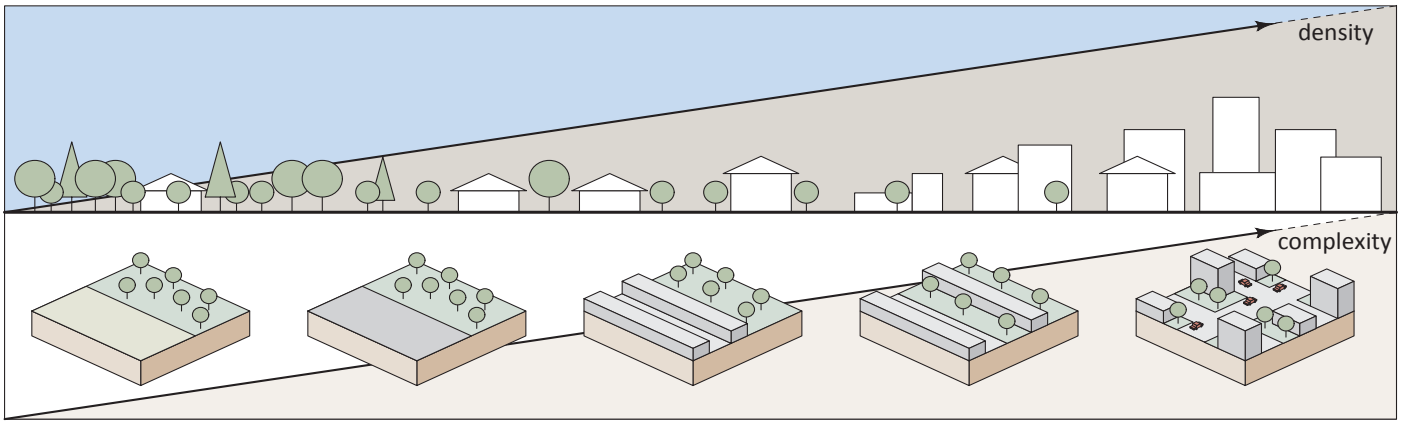

Calling for participants:

A new multi-site evaluation project for modelling in urban areas

It has been a decade since The First International Urban Land Surface Model Comparison Project (PILPS-Urban) evaluated 32 models at two urban sites (Grimmond et al., 2010, 2011). Since then intense community effort has led to new and improved urban models, with particular focus on integrating vegetation-related processes at the neighbourhood scale. At the same time, increasing resolution of weather and climate simulations has led to higher expectations for representing urban surface-atmosphere processes. So, how have model developments affected performance, and how do different modelling approaches compare across varying levels of urban density and vegetation?

We invite you to help answer these questions by participating in the Urban-PLUMBER project, starting in **May 2020** and running for 12 months.

Who should get involved?

Both modellers and those with urban flux tower observations are invited to participate.

Modelling participants: Models that simulate neighbourhood-scale radiant and turbulent fluxes representative of above roof height exchange can participate. Both specialised urban land surface models (LSM) and LSM without an explicit urban representation (e.g. vegetation-focussed models) are of interest. LSM will be run offline (i.e. uncoupled to an atmospheric model) at a range of sites. Those who provide model outputs will be invited as authors on relevant papers.

Flux tower data participants: Local-scale urban flux tower observations will be used to both drive models and evaluate outputs. Meteorological information (air temperature, pressure, humidity, precipitation) as well as downwelling short and longwave fluxes will be provided to participants. Evaluation data (turbulent and upwelling radiant fluxes) will be used by the core team to evaluate model output, but will not be distributed to modelling participants. Those who provide observational data will be invited as authors on relevant papers.

What are the key science questions?

1. *How have new developments affected model performance since PILPS-Urban?*
2. *Where do different modelling approaches excel across increasingly urbanised sites?*
3. *How does more detailed morphology information affect model performance?*
4. *Are models utilising available meteorological information effectively?*

Key outputs

We expect at least two papers from this project. The first will focus on how developments have affected urban model performance since the last major comparison at a single site. The second will assess how different models perform at different points along the urban/vegetation fraction continuum. Analysis will draw on methods of other recent LSM evaluation projects like SUBLIME (Steeneveld et al., 2017) and PLUMBER (Best et al., 2015).

Resources to make participation simpler

Often the most time-consuming aspect of evaluation projects is getting inputs and outputs in complying form. We offer the following to streamline this process:

1. **Input forcing available in either netCDF or text format:** Two equivalent meteorological forcing files will be provided: text and netCDF. The text file is formatted per the PILPS-Urban project, while the netCDF file is formatted per the PLUMBER project.
2. **Example scripts available to convert output data into complying netCDF:** We require output to be in a standard netCDF form to allow evaluation. As some groups may not have used netCDF, we will provide a Python script to translate model output (in text form, for example) to a complying netCDF file with appropriate metadata.

3. **Example scripts available to automate model configuration in the multi-site phase:** To speed up application to ~20 sites and reduce inconsistencies of how site information is used, we encourage participants to use a script which reads the provided standard site data information table and writes model configuration files. We will provide an example script that does this, and provide help if required.
4. **Immediate feedback provided on output to help identify issues:** Through an online portal, model output can be checked for compliance, basic performance analysed, and immediate feedback provided. This allows participants to spot obvious errors (e.g. mislabelled or wrongly-signed variables) and resubmit if required.

This project is challenging as it will include about 20 sites, and will include a wide variety of models with different standards. We hope the above steps make participation simpler, and that you will join us to help push forward the latest in urban land surface modelling.

What to do to get involved

Email met-urban-plumber@lists.reading.ac.uk to register your interest, either as a modeller or by providing flux tower data. We can then provide you with full instructions for participation.

Acknowledgments

We gratefully acknowledge those who have supported this project, provided valuable feedback, and offered observational datasets including Gab Abramowitz, Andrew Coutts, Helen Ward, Aristofanis Tsiringakis, Gert-Jan Steeneveld, Denise Hertwig, Natalie Theeuwes, Martin De Kauwe and Andrew Pitman.

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Urban Climatology Course (UCC) launched in Colombia

By Iain D. Stewart
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A new initiative in urban climate teaching was launched in Colombia in 2019. The Universidad Nacional de Colombia hosted the first Urban Climatology Course (UCC) at its campus headquarters in the cities of Manizales and Medellin. Course organizers are hoping other cities and institutions will consider hosting UCC in the future.

UCC origins

The idea behind UCC originated in 2018, when professors Freddy L. Franco, Dalia N. Roncancio, and Jeannette Zambrano invited me to teach a one-week course (in English) on urban climatology for students and faculty members of civil engineering. I accepted the invitation and over the next six months we developed a course outline that fit the needs of the engineering group, and that supported the existing strengths of the university's research and teaching programs. This was a groundbreaking initiative: bringing urban climate instruction to a tropical region with no history of formal training in the subject, but with increasing numbers of students and professors working on related topics. The final outcome was a UCC module that introduces academics and urban professionals to the science and practical applications of urban climatology, and that transfers easily from tropical to non-tropical cities, regions, and institutions.

Course objectives

UCC aims to provide a broad foundation in urban climate science through a compact series of classroom lectures and lab exercises. Interconnecting these activities is an underlying emphasis on methodological standards in urban climatology, relating to proper siting of climate stations and meteorological sensors in urban areas, and appropriate use of urban design strategies for climate mitigation and adaptation. Upon completion of UCC, participants are able to evaluate the quality and purpose of climate data in their own projects, and to think critically about the established methods and results in the urban climate literature.

Course content

Much of the content for UCC is sourced from the book *Urban Climates* (2017, Cambridge University Press) by T.R. Oke and co-authors G. Mills, A. Christen, and J.A. Voogt. The content is adapted to the geographical and architectural setting of the host city, and targeted to local issues such as air pollution, urban heat, urban expansion, environmental monitoring, meteorological hazards, greenhouse gas emissions, and sustainable development. Lectures span the breadth of urban climatology, covering (i) core methods, concepts, and classifications; (ii) urban effects on temperature, precipitation, and airflow; (iii) cities and global climate change; (iv) megacities and urban metabolism; and (v) climate-sensitive urban design. Labs are focused on the practical application of these topics, and require participants to use climate station networks, observational weather datasets, Google Earth tools, WMO instrumentation guidelines, and Local Climate Zone classification methods. Also included is an excursion to an air monitoring station in the host city.

Course participants

UCC is geared to a wide range of participant backgrounds including engineering, architecture, planning, forestry, geography, meteorology, air quality, and landscape design. Intersecting these diverse backgrounds are the textbook fundamentals of urban climatology, which provide participants with the foundational knowledge to use and understand urban climate models, datasets, and frameworks. This process is conveyed by the UCC instructor in simple language for people with little or no training in climate science, but whose work relates to urban environments both social and physical.

UCC 2019

Enrollment for UCC 2019 in Manizales (June 17–21) and Medellin (November 18–29) reached full capacity of 25 participants in both cities. Participants were selected from a pool of nearly 100 applicants from across Colombia and beyond (e.g., Mexico, Bolivia). Selection was based on the interest and involvement of the applicants in urban climate activities, their commitment to attend all lectures and labs, and their level of English proficiency.

An impressive group of students, professors, and scientists from universities and local governments participated in UCC 2019. All participants shared a common vocation to improve the natural environment of Colombian cities, which gave rise to a fascinating synergy of ideas and discussions around the course topics. This synergy was helped by support received from the Universidad Nacional de Colombia; Universidad EAFIT (Medellin); Institute of Environmental Studies (Manizales); Medellin Botanical Garden; and the Aburra Valley Early Warning System (Medellin).

Interested in hosting UCC?

Cities and institutions interested in hosting UCC in Colombia or in other countries should contact the course organizers, **Iain D. Stewart** and **Dalia N. Roncancio**, for information on costs and availability. Additional details are available on the course website: https://cursoclimatologiau.wixsite.com/course

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The topography of Manizales (left) and Medellin (right) presents many challenges for studying urban effects on local climate.

UCC participants in Manizales (left) and Medellin (right) learn to use the Local Climate Zone classification scheme through lectures, labs, and participatory research.

Fieldtrip to an air surveillance station at the state government building in Manizales.

Participants touring the risk management centre in Medellin.

Report on the "Symposium on Challenges in Applied Human Biometeorology" March 2-3, 2020 in Freiburg, Germany

Gerhard Adrian, President of the World Meteorological Organization and President of the German Meteorological Service addressed the conference participants in the historic lecture hall on March 2, 2020.

By Si-Yu Yu, Tzu-Ping Lin, Andreas Christen and Andreas Matzarakis

Facing impacts of climate change and urbanization, adaptation and resilience to climate extremes have become important issues of global concern. A better understanding of the interaction between environmental changes and the responses of human health are critical in both improving the built environment in urban areas, and establishing appropriate strategies on behalf of living quality and human welfare.

To discuss recent advances and future directions, the "Symposium on Challenges in Applied Human Biometeorology" organized by the Chair of Environmental Meteorology, Albert-Ludwigs-University Freiburg, in collaboration with the Research Centre Human Biometeorology of the German Meteorological Service, Freiburg, and the Society for the Promotion of Human Biometeorological Research in Germany was held at Albert-Ludwigs-University Freiburg on 2 – 3 March 2020. More than 90 experts, researchers, and science officers from over 35 nations participated in the symposium and gave keynote speeches, presented the latest research results, and shared their experiences of communicating science. The symposium demonstrated that, to succeed in delivering services to society, we need an interdisciplinary scientific diagnosis, the establishment of universal criteria to assist and guide more concrete implementations, and professional communication.

The importance of researchers in different fields networking to collaborate and to engage were addressed in the opening ceremony by Gerhard Adrian, President of the World Meteorological Organization (WMO) and President of the German Meteorological Service (DWD). Hans-Jochen Schiewer, the rector of Albert-Ludwigs-University Freiburg, addressed the participants and concluded that "Cities, societies and economies worldwide are affected by climate change on various spatial and temporal scales and that many of the challenges represent a central theme in human biometeorology – heat stress, air quality, allergens, diseases." He encouraged the

Impressions from the Symposium.

attendees to discuss how the field of human biometeorology can network, advance, and help to increase the quality of life in times of uncertainties.

The scientific program of the symposium opened with a keynote speech by Peter Höppe who presented an excellent historical perspective on "the long way from single-parameter indices to complex and universal thermal models of the human body." He introduced the development paths of different indicators and calculation methods for thermal comfort assessment over the decades, and inspired all participants by mentioning the possibilities of improved analysis and application. During the two days of the Symposium, sessions on "Health," "Bioclimate in Urban Environments," "New methods and tools in Human Biometeorology," "Communication and warning," "Thermal indices," "Climate Change," and "Bioclimate, planning and design" provided a comprehensive coverage of interactions between climate change, human biometeorology, and urban climate, all of which stimulated interesting discussions. The symposium was closed by the organizers Andreas Matzarakis and Andreas Christen who, in their closing remarks, reflected on future perspectives on modeling / communication and the intersection between urban climate and human biometeorology.

To encourage the participation of young and junior research fellows, the symposium was supported with travel grants for participants from less developed countries. The Tromp Foundation supported three awards. The International Association for Urban Climate sponsored travel awards for two participants, Betty Adegebo (Nigeria) and Aditya Rahul (India) who presented their research on "Vulnerability of poor urban populations to temperature-related health issues in Ibadan, Nigeria" and "Impact Analysis of Dynamic Bluespace on Human Biometeorology: Case of Roorkee," respectively. In addition, two participants received a best oral presentation award (Si-Yu Yu for "Assessment of thermal environment

IAUC travel grant awardees Aditya Rahul (left) and Betty Adegebo (right) receive their certificates.

and air quality in compact Built Environment in Hot-Humid Regions" and Rohini Maunder Chakraborty for "Analyzing Outdoor Thermal Comfort with Proximity to Water Bodies in Tropical Humid Climate - Case Study of Kolkata, India." Best poster presentation awards went to Sebastian Schlögl and co-authors for «High resolution meteorological station network in Swiss Cities: City Weather Monitoring and operational forecasts" and to Andreas Krein and co-authors for "Future heat waves along latitudinal transect across Europe based on climate change indicators".

The symposium gathered not only the international experts in different fields, but was well attended by younger generations of scientists interested in contributing to the field. As Andreas Matzarakis mentioned in his closing remarks "Bringing in and helping more young people to join the field of human biometeorology is the most important challenge."

Tromp travel award.

ROME, 5 FEBRUARY 2020 — At an event entitled "Biocities: towards establishing an EFI facility on Urban and Periurban Forests," Simone Borelli of the FAO describes the importance of urban forests in the context of the UN Sustainable Development Goals – among which 'Climate Action' is prominent.

Recent Urban Climate Publications

Al-Hemoud A, Gasana J, Al-Dabbous A, Alajeel A, Al-Shatti A, Behbehani W, Malak M (2019) Exposure levels of air pollution (PM2.5) and associated health risk in Kuwait. *Environmental Research* 179

Badas MG, Salvadori L, Garau M, Querzoli G, Ferrari S (2019) Urban areas parameterisation for CFD simulation and cities air quality analysis. *International Journal of Environment and Pollution* 66 5-18.

Bedford J, Farrar J, Ihekweazu C, Kang G, Koopmans M, Nkengasong J (2019) A new twenty-first century science for effective epidemic response. *Nature* 575 130-136.

Berrocal VJ, Guan Y, Muyskens A, Wang H, Reich BJ, Mulholland JA, Chang HH (2020) A comparison of statistical and machine learning methods for creating national daily maps of ambient PM2.5 concentration. *Atmospheric Environment* 222

Bisignano A, Ferrero E, Alessandrini S (2019) A Lagrangian dispersion model with a stochastic equation for the temperature fluctuations. *International Journal of Environment and Pollution* 65 311-324.

Boutet ML, Hernandez AL, Jacobo GJ (2020) Methodology of quantitative analysis and diagnosis of higro-thermal and lighting monitoring for school buildings in a hot-humid mid-latitude climate. *Renewable Energy* 145 2463-2476.

Butturi MA, Lolli F, Sellitto MA, Balugani E, Gamberini R, Rimini B (2019) Renewable Energy in eco-industrial parks and urban-industrial symbiosis: A literature review and a conceptual synthesis. *Applied Energy* 255

Cao W, Huang L, Liu L, Zhai J, Wu D (2020) Overestimating Impacts of Urbanization on Regional Temperatures in Developing Megacity: Beijing as an Example (vol 2019, 3985715, 2019). *Advances in Meteorology* 2020

Chambers SD, Podstawczynska A (2019) Improved method for characterising temporal variability in urban air quality part II: Particulate matter and precursors in central Poland. *Atmospheric Environment* 219

Chen S, Long H, Chen B, Feng K, Hubacek K (2020) Urban carbon footprints across scale: Important considerations for choosing system boundaries. *Applied Energy* 259

Chen Y, Wild O, Ryan E, Sahu SK, Lowe D, Archer-Nicholls S, Wang Y, McFiggans G, Ansari T, Singh V, Sokhi RS, Archibald A, Beig G (2020) Mitigation of PM2.5 and ozone pollution in Delhi. a sensitivity study during the pre-monsoon period. *Atmospheric Chemistry and Physics* 20 499-514.

Collins TW, Grineski SE, Chakraborty J, Flores AB (2019) Environmental injustice and Hurricane Harvey: A household-level study of socially disparate flood exposures in Greater Houston, Texas, USA. *Environmental Research* 179

Cui Y, Ji D, Chen H, Gao M, Maenhaut W, He J, Wang Y (2019) Characteristics and Sources of Hourly Trace Elements in Airborne Fine Particles in Urban Beijing, China. *Journal of*

In this edition is a list of publications that have generally come out between **November 2019 and February 2020**. If you believe your articles are missing, please send your references to the email address below with a header "IAUC publications" and the following format: Author, Title, Journal, Year, Volume, Issue, Pages, Dates, Keywords, URL, and Abstract. Important: do so **in a .bib format.**

Note that we are always looking for (young) researchers to join and contribute to the Committee. If you are interested to join or would like to receive more information, please let me know via the email address below.

Happy reading,

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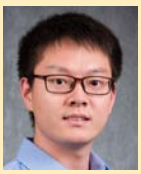
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Geophysical Research-atmospheres 124 11595-11613.

Cui Y, Ji D, He J, Kong S, Wang Y (2020) In situ continuous observation of hourly elements in PM2.5 in urban beijing, China: Occurrence levels, temporal variation, potential source regions and health risks. *Atmospheric Environment* 222.

Davis ZYW, Baray S, McLinden CA, Khanbabakhani A, Fujs W, Csukat C, Debosz J, McLaren R (2019) Estimation of NOx and SO2 emissions from Sarnia, Ontario, using a mobile MAX-DOAS (Multi-AXis Differential Optical Absorption Spectroscopy) and a NOx analyzer. *Atmospheric Chemistry and Physics* 19 13871-13889.

De Dominicis M, Wolf J, Jevrejeva S, Zheng P, Hu Z (2020) Future Interactions Between Sea Level Rise, Tides, and Storm Surges in the World's Largest Urban Area. *Geophysical Research Letters* 47 e2020GL087002.

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Upcoming Conferences...

The information in this list is current as of the publication date of the newsletter, but readers should check for updated information online in the event of schedule changes due to the COVID-19 pandemic.

EGU-2020: SHARING GEOSCIENCE ONLINE
Vienna, Austria • May 3-8, 2020
https://www.egu2020.eu/

SSC-2020 CONFERENCE: ADVANCED TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT OF URBAN GREEN INFRASTRUCTURE
Moscow, Russia • July 8-10, 2020
http://ssc-conf.org

BOCHUM URBAN CLIMATE SUMMER SCHOOL: URBAN CLIMATE INFORMATICS, RUHR UNIVERSITY
Bochum, Germany • August 17-21, 2020
https://www.climate.ruhr-uni-bochum.de/bucss/

PLANNING POST CARBON CITIES: 35TH PLEA CONFERENCE ON SUSTAINABLE ARCHITECTURE AND URBAN DESIGN
A Coruña, Spain • September 1-3, 2020
https://www.plea2020.org

EMS ANNUAL MEETING 2020 SESSION ON "INTERACTIONS OF AIR POLLUTANTS, GREENHOUSE GASES, WEATHER AND CLIMATE FROM LOCAL/URBAN TO GLOBAL SCALES"
Bratislava, Slovakia • September 7-11, 2020.
https://meetingorganizer.copernicus.org/EMS2020/session/38131

4TH ICOS SCIENCE CONFERENCE, SESSION ON "URBAN OBSERVATIONS AND DETECTION OF HUMAN EMISSIONS"
Utrecht, Netherlands • September 15-17, 2020
https://www.icos-ri.eu/sc2020

Call for nominations – 2020 Luke Howard Award

The IAUC is pleased to announce the call for nominations for the 2020 'Luke Howard Award for Outstanding Contributions to the Field of Urban Climatology.'

The Luke Howard Award may be given annually to an individual who has made **outstanding contributions to the field of urban climatology** in a combination of **research, teaching, and/or service** to the international community of urban climatologists.

The IAUC is committed to promoting equality and diversity. Therefore we particularly encourage nominations for suitable candidates from under-represented groups.

The person making the nomination will act as the coordinator to put together a nomination package (including a CV of the nominee and three letters of recommendation). Self-nominations are not permitted and current Awards Committee members cannot be evaluated. Complete nomination packages should be submitted (as a single electronic submission) to the IAUC Awards Committee Chair, **Dr. Helen Ward**: helen.ward@uibk.ac.at

Luke Howard Award Nomination Process:

• Inform the Awards Committee Chair of the intent to nominate an individual.The intent to nominate should be communicated via email to the Awards Committee Chair by **Fri 29 May 2020**;

• Nomination materials should be collected by the coordinator (i.e. the person notifying the Awards Committee Chair that a particular individual will be nominated);

• The coordinator should collect and submit the following documentation in a single pdf file:

1) a three-page candidate CV

2) three letters of recommendation (of no more than two pages in length) from IAUC members from at least two different countries;

• Complete packages should reach the Awards Committee Chair by **Fri 26 June 2020**.

The IAUC Awards committee will then recommend the name of a recipient for consideration and approval by the IAUC Board. Nominations will be active for three years, and updated information may be submitted for consideration in the second and third years.

Previous winners include:

• 2019 Professor **Janet Barlow**, University of Reading, UK

• 2018 Professor **Wilhelm Kuttler**, University of Duisburg-Essen, Germany

• 2016 Dr **Walter Dabberdt**, Vaisala Group, USA

• 2015 Professor Emeritus **Anthony Brazel**, Arizona State University, USA

• 2014 Professor **Manabu Kanda**, Tokyo Institute of Technology, Japan

• 2013 Professor Emeritus **Yair Goldreich**, Bar-Ilan University, Israel

• 2010 Professor **John Arnfield**, The Ohio State University, USA

• 2009 Professor **Sue Grimmond**, King's College, UK

• 2008 Professor **Bob Bornstein**, San José State University, USA

• 2007 Professor (Emeritus) **Masatoshi Yoshino**, University of Tsukuba, Japan

• 2006 Professor **Arieh Bitan**, Tel Aviv University, Israel

• 2005 Professor **Ernesto Jauregui**, UNAM, Mexico

• 2004 Professor **Tim Oke**, UBC, Canada

The Timothy Oke Award: a new IAUC award for early- and mid-career scientists

The IAUC is delighted to announce a new award to celebrate the achievements of early- and mid-career researchers. The 'Timothy Oke Award for Original Research in the Field of Urban Climatology' recognises the contributions of a new generation of urban climatologists and fills the gap between the IAUC's numerous student awards and the IAUC's highest accolade, the Luke Howard Award.

The Timothy Oke Award addresses a critical phase in the career of an urban climate scientist, when they achieve individual visibility and impact, develop and broaden the scope of their research topics and demonstrate leadership. For the recipients, this award provides a prestigious endorsement of their research trajectory that may help to further advance their career prospects. The unanimous decision was made by the IAUC Board to name this award in honour of Professor **Timothy Oke**, as recognition of his outstanding research career, his support for young urban climatologists and his unprecedented contributions to both urban climatology and the establishment of the IAUC.

The IAUC is committed to promoting equality and diversity. As such, the guidelines for this award are that candidates should be approximately 3-12 years after PhD, but nominations for candidates who fall outside these guidelines due to career breaks or non-conventional career paths will also be considered, providing they are justified. All nominations will be assessed according to career stage. The Timothy Oke Award can be given for a particularly relevant study, a collection of papers or continuous work on a relevant topic with high impact on the field. It should be given for research that was conducted after the PhD. The award should reflect the diversity of the membership in terms of regions, gender, and disciplines. As the IAUC membership is currently dominated by those in early- and mid-career stages, it is envisaged that there could be many eligible recipients in the first few years. Therefore, the IAUC Awards Committee will select up to three awardees each year. Further details including the nomination procedure can be found in the Call for Nominations.

ICUC-11 in Sydney, Australia: Looking ahead to 2021

Dear IAUC community,

We acknowledge that these are times of unprecedented change and uncertainty, and the current circumstances with COVID-19 have introduced significant challenges for all researchers globally.

We are writing to check-in with you and share a few updates regarding ICUC11, with the hope that this acts as a message of hope that this period of uncertainty and self-isolation will soon be behind us and we look forward to being able to see you all in Sydney in August 2021.

Key developments regarding the conference are now included on our conference website - https://conference.unsw.edu.au/en/icuc11. This will be continually updated as we progress towards the conference.

Scientific Committee

The ICUC scientific committee was selected to lead the development of the multi-disciplinary conference's scientific program. We are committed to providing an

inclusive and diverse conference and this is represented in our scientific committee which includes representatives that represent the geographic, gender and cultural background of our members. You can see the members of the scientific committee on the conference website.

Important Dates

Sessions/workshops/panels submission: until Apr 30, 2020

Opening of Abstract Submission: Aug 17, 2020

Deadline for Abstract Submission: Nov 15, 2020

Acceptance of Abstract: Jan 25, 2021

Optional full paper / supplementary materials: Mar 30, 2021

Conference: Aug 30 - Sep 3, 2021

Call for Sessions, Workshops, and Panel discussions

The general theme of the conference is "Cities as Living Labs: Climate, Vulnerability, and Multidisciplinary Solutions" with 4-5 parallel (oral and poster) presentation sessions conducted to cover a diverse range of topics related to urban climatology. Accordingly, the organizing committee has identified six scientific streams for ICUC11, with each stream covering various sessions and plenaries. These streams include:

- *Urban climate processes*
- *Urban climate methods*
- *Biometeorology & health*
- *Integrated assessments of urban climate*
- *Climate-conscious design and sustainable development*
- *Urban climate policy*

Specific topics within each stream can be found on the website.

Additionally, as we are committed to the professional development of early-career scientists and students, several events will be focused on this.

We now invite the community to inform us if there is a topic that is not covered by the proposed session themes, or if they would like to propose a workshop or special event. The deadline for this contribution is April 30, 2020.

We sincerely hope that you and your families are all safe in this difficult time and look forward to hearing your feedback.

Best,

ICUC Co-chairs, Negin and Melissa

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IAUC Board Members & Terms

- **President**: Nigel Tapper (Monash University, Australia), 2018-2022.
- **Secretary**: Andreas Christen (Albert-Ludwigs Universität Freiburg, Germany), 2018-2022.
- **Treasurer**: Ariane Middel (Temple University, USA), 2019-2022.
- Alexander Baklanov (WMO, Switzerland), *WMO Representative*, 2018-2022.**
- Benjamin Bechtel (Ruhr-University Bochum, Germany), 2017-2021.
- Matthias Demuzere (Ruhr-University Bochum, Germany and CEO and Founder Kode), 2018-2022.
- Jorge Gonzalez (CUNY, USA): *ICUC10 Local Organizer*, 2016-2021.
- Negin Nazarian (University of New South Wales, Australia): *Local Organizer ICUC-11*.
- Leena Järvi (University of Helsinki, Finland), 2016-2020.
- Dev Niyogi (Purdue University, USA): *ICUC10 Local Organizer*, 2016-2021.
- David Pearlmutter (Ben-Gurion University, Israel), *Newsletter Editor*, 2008-*
- Chao Ren (University of Hong Kong, Hong Kong), 2017-2021.
- David Sailor (Arizona State University, USA), *Past Secretary* 2014-2018.*
- James Voogt (University of Western Ontario, Canada), *Past President*: 2014-2018.*
- Helen Ward (University of Innsbruck, Austria), 2019-2022.

* non-voting, ** non-voting appointed member

IAUC Committee Chairs

- **Editor, IAUC Newsletter**: David Pearlmutter
  - News Editor: Paul Alexander
  - Urban Projects Editor: Helen Ward
  - Conferences Editor: Joe McFadden
- **Bibliography Committee**: Matthias Demuzere
- **Chair Teaching Resources**: Gerald Mills
- **Chair Awards Committee**: Helen Ward

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The next edition of ***Urban Climate News*** will appear in late June. Contributions for the upcoming issue are welcome, and should be submitted by May 31, 2020 to the relevant editor.

Submissions should be concise and accessible to a wide audience. The articles in this Newsletter are unrefereed, and their appearance does not constitute formal publication; they should not be used or cited otherwise.

Bibliography: Matthias Demuzere and BibCom members
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