

January 21, 2024

Dr. Monica Contestabile,  
Chief Editor, *Nature Sustainability*

Dear Dr. Contestabile:

Please find enclosed our revised manuscript with the revised title “Hazardous heat exposure among incarcerated people in the United States” (NATSUSTAIN-23093333B). We have revised the text according to the comments and suggestions of the Editors, as outlined in our responses. Please find our responses to the Editors, as requested, below:

**Dear Dr. Parks,**

**Thank you for your patience as we’ve prepared the guidelines for final submission of your Nature Sustainability manuscript, "Trends and disparities of hazardous heat exposure among incarcerated people in the United States" (NATSUSTAIN-23093333A). Please carefully follow the step-by-step instructions provided in the attached file, and add a response in each row of the table to indicate the changes that you have made. Please also check and comment on any additional marked-up edits we have proposed within the text. Ensuring that each point is addressed will help to ensure that your revised manuscript can be swiftly handed over to our production team.**

**We would like to start working on your revised paper, with all of the requested files and forms, as soon as possible (preferably within two weeks). Please get in contact with us if you anticipate delays.**

We anticipate no delays.

**When you upload your final materials, please include a point-by-point response to any remaining reviewer comments.**

We have done this.

**If you have not done so already, please alert us to any related manuscripts from your group that are under consideration or in press at other journals, or are being written up for submission to other journals (see: <https://www.nature.com/nature-research/editorial-policies/plagiarism#policy-on-duplicate-publication> for details).**

**In recognition of the time and expertise our reviewers provide to Nature Sustainability’s editorial process, we would like to formally acknowledge their contribution to the external peer review of your manuscript entitled "Trends and disparities of hazardous heat exposure among incarcerated people in the United States". For those reviewers who give their assent, we will be publishing their names alongside the published article.**

We acknowledge this.

### Cover suggestions

We welcome submissions of artwork for consideration for our cover. For more information, please see our [https://www.nature.com/documents/Nature\\_covers\\_author\\_guide.pdf](https://www.nature.com/documents/Nature_covers_author_guide.pdf) target="new"> guide for cover artwork.

If your image is selected, we may also use it on the journal website as a banner image, and may need to make artistic alterations to fit our journal style.

Please submit your suggestions, clearly labeled, along with your final files. We'll be in touch if more information is needed.

We have submitted a proposed cover art. As with previous work we have proposed, we'd be very happy to work with you to provide edits to get the cover art suitable for the issue of Nature Sustainability that we will be published in.

### ORCID

Non-corresponding authors do not have to link their ORCIDs but are encouraged to do so. Please note that it will not be possible to add/modify ORCIDs at proof. Thus, please let your co-authors know that if they wish to have their ORCID added to the paper they must follow the procedure described in the following link prior to acceptance: <https://www.springernature.com/gp/researchers/orcid/orcid-for-nature-research>

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If you have any further questions, please feel free to contact me.

Unbearable and dangerous temperatures were common throughout the United States during the summer of 2023, with over 100 million people exposed to hazardous heat. Among the 2 million people currently incarcerated in the United States, concerning reports surfaced of heat-related illness and death over the last several summers. This is hardly surprising – incarcerated people in the United States are at high risk for heat-related morbidity and mortality in large part because they are physically confined, socially isolated, and have high rates of chronic mental and physical illnesses. Unlike most of the population in the United States, many incarcerated people are living without air conditioning.

While a nascent body of research has begun to explore how dangerous heat is impacting incarcerated people, this has largely been through case studies. Researchers and policymakers are yet to address the critical knowledge gap of understanding exposure to dangerous heat at carceral facilities across the country over multiple decades. As the effect of climate change accelerates in the United States, identifying where incarcerated people are exposed to dangerous heat is imperative to advancing environmental justice for one of the most marginalized groups in the country.

In the accompanying manuscript, titled “*Trends and disparities of dangerous humid heat exposure among incarcerated people in the United States*”, we fill this critical knowledge gap. We map daily maximum wet bulb global temperatures to 4,078 federal, state, and local carceral facility across the US to measure the trends in the number of dangerous humid heat days per year during 1982 – 2020. We (1) characterize dangerous humid heat at each carceral facility location and by facility type and state; (2) measure how exposure to dangerous humid heat at carceral facility locations compares with the rest of the population nationally and by state; and (3) calculate how the trends over of dangerous humid heat at carceral facilities has changed over time.

Our results reveal new and pressing insights about the disparities incarcerated people in the United States face when contending with dangerous humid heat. We find:

- During 2016 – 2020, on average annually, there were 41.25 million person-days of exposure at US carceral facilities, with the greatest contribution from state prisons (61%);
- There was a consistent disparity during 1982 - 2020, with carceral facilities exposed to an average of 5.5 more dangerous humid heat days than the rest of the US annually;
- An estimated 915,627 people (45% of total) are incarcerated in 1,739 facilities that experienced an annual increase in the number of dangerous humid heat days per year during 1982 – 2020; and
- Southern US facilities exhibited the most rapid warming, though many of these states do not mandate access to air conditioning for incarcerated people.

By identifying where incarcerated people are exposed to dangerous heat conditions, our work highlights how incarcerated people in the United States are systematically exposed to greater levels of dangerous humid heat than the rest of the United States population, with the greatest exposure and rates of increase concentrated in state-run institutions. We expect our work can aid federal, state, and local decisionmakers in efforts to mandate safe temperature ranges, enhance social and physical infrastructure, and implement health system interventions to mitigate the effect of dangerous heat on this marginalized group. To this end, all data and code supporting this analysis will be made publicly available upon publication, including the

entire historical daily maximum wet bulb globe temperature record during 1982 – 2020 we construct for each carceral facility in the United States.

Because of the pressing and novel nature of our findings, we are resubmitting this revised manuscript for publication as a Brief Communication to *Nature Sustainability*. None of this material has been published or is under consideration elsewhere.

On behalf of our co-authors, we thank you for your time and consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'Cascade Tuholske'.

Cascade Tuholske, PhD (he/his)  
Asst. Professor of Human-Environment Geography  
Dept. of Earth Sciences  
Montana State University

A handwritten signature in black ink, appearing to read 'Robbie M. Parks'.

Robbie M. Parks, PhD (he/his)  
Asst. Professor of Environmental Health Sciences  
Mailman School of Public Health  
Columbia University