

Unsporting climate



Participating in or spectating at sporting events is a favourite pastime for many, but climate change could alter the sporting landscape. Yet, sports are unifying to be part of the solution.

Climate change will directly impact sports events and athletes through increased extreme weather events, such as thunderstorms and floods, as well as heatwaves and temperature extremes. This past year has already seen these impacts, with the recent example of Tour de France organizers planning ways to protect the riders and reduce the approximately 60 °C road temperatures that can cause the asphalt surface to melt. Adjusting event timing is a common way to combat high temperatures, as seen at the 2019 Athletics World Championships in Qatar where the marathon started at midnight. However, as climate change continues and higher temperatures become the new normal, will summer events need to shift to the cooler months of the year to proceed? A 2022 study considered climates that would be suitable for the Olympic marathon at the end of the century, and it was found that more countries could host the event if it was moved to October¹.

Winter sports also suffer from warmer temperatures. Images of ski fields with runs only available with man-made snow in the middle of the season highlight the uncertainty of snow futures. The [Beijing Winter Olympics in 2022](#) was the first Olympics to use almost 100% artificial snow, and without snowmaking future warming means that many snow resorts are at high risk for low snow supply – one study showed that 53% (98%) of 2,234 resorts in 28 European countries with 2 °C (4 °C) of warming were at risk².

This impact of climate applies at all levels, from elite sport to community, and includes social physical activity. A systematic review³ found that extreme temperatures, air pollution and natural disasters all reduced physical activity levels, and this was most pronounced in older adults, as well as in adults with chronic



diseases and higher body mass index. Yet, sports and physical activity communities are important social networks for resilience and recovery following disasters, so if climate change reduces participation, these benefits could be lost.

But large-scale sporting events aren't just being affected by climate change, they are also contributing to emissions. Events such as world championships and the Olympics bring competitors, support staff and spectators from around the world. As other sectors do, it is important that these events also consider sustainability and climate and environmental impact.

An analysis of the winter and summer Olympics between 1992 and 2020 showed a medium level of sustainability for the events⁴, which declined for the events over the study period. Yet, moving to this year, if we consider the recent Paris Summer Olympics, sustainability was a central focus in the lead up to the event with the publication of a sustainability and legacy report⁵. The event made use of existing infrastructure or temporary venues that could be repurposed, reused or recycled after the event. Before the event, it was touted that this would be 95% of the required infrastructure.

The athlete village was a new development, which will be converted to a new city district, and made use of low-carbon construction techniques, including the use of wood and low-carbon concrete, with claims of a 30% reduction in greenhouse gas emissions per square metre⁵.

This progress aligns with the [October 2021 commitment](#) by the International Olympic Committee to reduce direct and indirect emissions by 30% by 2024 and by 50% by 2030. Further commitments by sports organizations can be seen by the signatories to the [UNFCCC Sports for Climate Action](#). It sets clear objectives to achieve commitments for sports organizations to measure, reduce and report greenhouse gas emissions, linked with the Paris Agreement targets, and to use sports to unify global citizens for climate action.

Published online: 6 September 2024

References

- Oyama, T. et al. *Sci. Rep.* **12**, 4010 (2022).
- François, H. et al. *Nat. Clim. Change* **13**, 935–942 (2023).
- Bernard, P. et al. *Sports Med.* **51**, 1041–1059 (2021).
- Müller, M. et al. *Nat. Sustain.* **4**, 340–348 (2021).
- Paris 2024 Sustainability & Legacy Pre-Games Report* (Paris 2024, May 2024); <https://go.nature.com/4dENQ9v>