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## **Academic Conferences Urgently Need Environmental Policies**

Matthew H Holden<sup>1,2</sup>, Nathalie Butt<sup>1,2</sup>, Alienor Chauvenet<sup>1,2</sup>, Michaela Plein<sup>3</sup>, Martin Stringer<sup>1,3</sup>, and Iadine Chades<sup>4,1</sup>

<sup>1</sup>ARC Centre of Excellence for Environmental Decisions, University of Queensland, Brisbane, Australia

<sup>2</sup>School of Biological Sciences, University of Queensland, Brisbane, Australia

<sup>3</sup>School of Earth and Environmental Sciences, University of Queensland, Brisbane, Australia

<sup>4</sup>CSIRO, Brisbane, Australia

### **Abstract**

We conducted the first global analysis of environmental impact policies of reputable, international, academic conferences. Only five of the 116 conferences sampled provided carbon offset programs for participants, and only 11 advertised any type of sustainability practices at all.

### **Main text**

Travelling to conferences is arguably an essential part of an academic career, for increased flow of ideas, visibility, and networking opportunities. It is also a key contributor to CO<sub>2</sub> emissions (1–5), at a time when we need to reduce them. For at least the past 17 years, scientists have frequently called for sustainable conferencing (6, 7), and yet from our experience, collectively attending conferences in fields as diverse as ecology, math, computer science and astrophysics, relatively few meetings provided us opportunities to reduce our carbon footprint. Looking to find out how common our experience was, we discovered that thus far, there has been no global assessment of the environmental policies of scientific meetings.

Therefore, we reviewed the environmental and sustainability policies of 116 reputable academic conferences (see Methods for definition), across 18 scientific disciplines, and 31 countries within six continents (Fig. 1). Only 11 conferences (9%) described measures to reduce the environmental impact of their meeting, and even fewer (five, 4%) provided a carbon offset program, option, or guideline for participants.

Within the disciplines related to climate change research, few conferences advertised policies or actions to mitigate or reduce the environmental impact of their meeting (Fig 1b). For example, even in the field of Sustainability Science, only one out of ten conferences included online material describing their environmental impact and practical actions to lessen it (Fig 1b). The fields of Ecology and Conservation Science had the highest percentage of conferences advertising sustainability practices.

Five of the ten conferences sampled in this field advertised at least one action taken to increase sustainability, with four of these conferences officially offering carbon offset options for participants.

Leaving aside the options of virtual conferencing (8, 9), there are several cheap and easy solutions available to reduce the negative environmental impact of conferences. These include offset programs, sustainable and zero-waste catering, and carbon neutral venues. Guidelines on how to organize carbon neutral events are freely available online (10), and reports in the scientific literature of successful carbon neutral conferences exist (6, 7). However, our study shows that these events are exceptions to the rule.

We acknowledge that there are valid arguments about the efficacy and ethics of using carbon offset programs as a way to mitigate environmental damage (11). While such reasons can provide a rationale for specific policy details, they must not be an excuse to avoid policy creation altogether. At a minimum, conferences should document and promote the actions they take to reduce environmental impacts, even if those actions are minimal. It is not just a matter of environmental justice, but also awareness and transparency.

With increasingly limited research funds, scientists should favour conferences that promote their sustainability policies. If scientists demand this information, then conferences will provide it, and in doing so, be motivated to think about and develop new sustainable practices.

The majority of academic conferences are put together by local organising committees of researchers who donate their valuable time for free. When we contacted conference organizers, many of them had never thought about the environmental impacts of their conference, some asking for more information on how they could reduce their impact in the future. The desire and opportunity exist, but the opportunity to build on and improve sustainable practices is limited because organising committees change each year. Academic societies could facilitate sustainable practices by developing clear policies and guidelines. A small investment by our academic societies right now has the opportunity to generate major positive impacts on the future well-being of our environment and lead the route to global sustainability.

## **Methods**

We selected a list of reputable international and national conferences, based on our knowledge and recommendations by colleagues, and closely analysed the corresponding conference websites. Therefore, these conferences are not a random sample, but rather guided by expert opinion. Achieving a random sample of large, reputable, academic conferences is difficult because no such list exists, and generating such a list via internet searches would yield many predatory conferences that have a strong internet presence, due to their use of search engine optimization and advertising.

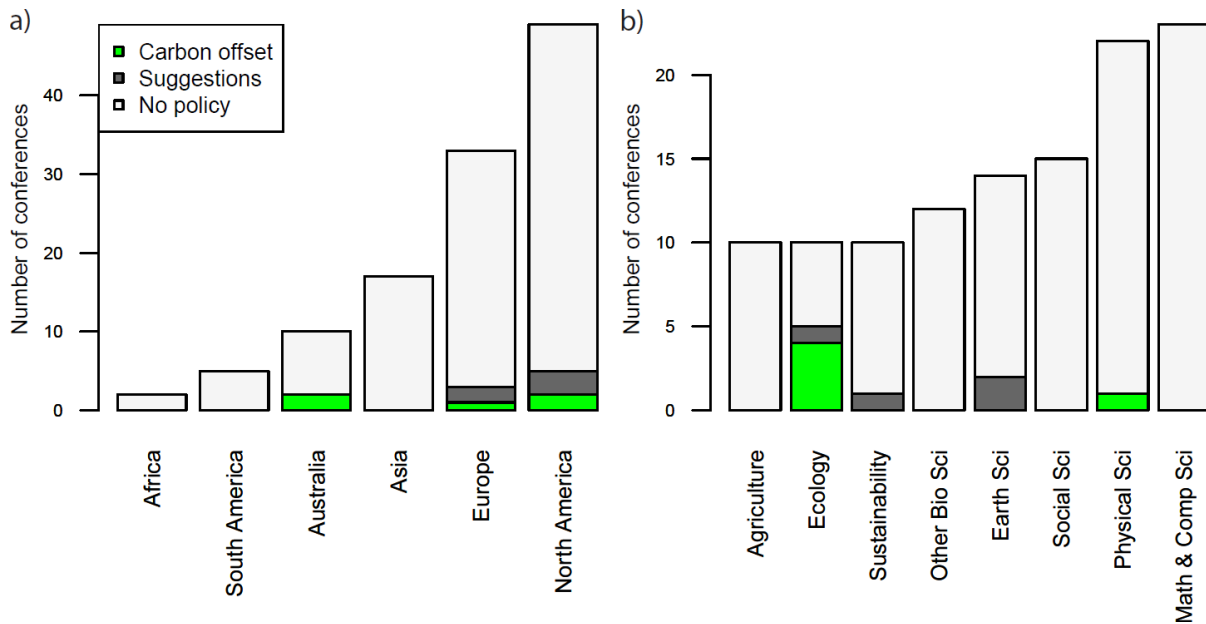
To ensure the accuracy of the data from conference websites, we emailed conference organizers about their inclusion in our study. The email contained information on the policies or lack of policies observed when searching their websites, and provided them the opportunity to correct any possible errors. Only 25 conferences replied to our email. In these emails, nine provided detailed information of actions taken to reduce environmental impacts that were not published on the society or conference webpage. The most common actions were relatively minor, such as reduced printing of conference programs, or providing glassware rather than single use water bottles. We decided not to include these actions in Fig. 1 because they are difficult to verify. The other 16 email replies simply confirmed that

the information on the conference website matched their policies and practices. Two conference organizers apologised for not having thought about offsets, both stating that they planned to implement offset programs in the future. One asked for guidance on how to implement such policies.

Because only 11 conferences advertised any form of sustainability practices, we did not focus on the specific nature of those policies here (however, see supplemental data for each conference's advertised practices). Instead, we reported the number of conferences in each discipline and whether they had an explicit environmental or sustainability policy.

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**Figure 1.** Number of conferences in the study (a) by continent and (b) by field. The proportion of each bar filled is the proportion of conferences which describe a sustainable practice on their conference website (dark grey) or a carbon offset policy (green). While there were 18 scientific disciplines represented (see supplemental data) we broke them down into broader fields here for easy displaying. “Ecology” contains conferences in ecology and conservation biology, ‘Other Bio Sci’ contains conferences in genetics, evolution, and microbiology, ‘Earth Sci’ contains conferences in meteorology, geology, and environmental science/engineering, ‘Social Sci’ contains conferences in psychology and economics, ‘Physical Sci’ contains conferences in physics, astrophysics, chemistry and non-environmental engineering, and ‘Math & Comp Sci’ contains conferences in mathematics, applied mathematics, statistics and computer science.

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