



Why do we fly? Ecologists' sins of emission

Peer-reviewed letter

We write to address an increasingly unsustainable paradox: a hallmark of modern science is frequent air travel, but the realities of global climate change will force us to find creative and constructive ways to reduce our carbon emissions (IPCC 1999; Pacala and Socolow 2004; Gremillet 2008). The unease about frequent flying should be particularly acute for the community of ecologists and conservation scientists – a group of professionals who commonly speak out against emissions, yet by virtue of their own behavior have individual carbon footprints that probably exceed the per capita footprints of most Americans.

We know of no large survey of carbon footprints for scientists or conservationists, so we each completed a carbon calculator (www.climatecrisis.net/takeaction/carboncalculator/) for 2007 (WebPanel 1) and documented our “sins of emission” (Figure 1). We thirteen conservation scientists span a wide range of jobs (academic institutions and non-governmental organizations) and career stages (junior to senior scientists), and – although not a random sample – we are fairly representative of those in the conservation field. The results give pause: the emissions from our flights account for an astonishing two-thirds of our average carbon footprint. Thus, in spite of considerably lower-carbon lifestyle choices (eg diet, purchasing/driving a hybrid car, home energy conservation) that made our non-flying carbon footprint 16% smaller than the average American's, our total emissions are double that of the American average and more than ten times the global average (Figure 1; WebPanel 1). The mismatch between individual behavior and conservation platitudes has already been noted (eg Bearzi 2009) and is a source of considerable embarrassment for the conservation community (Dowie 2008).

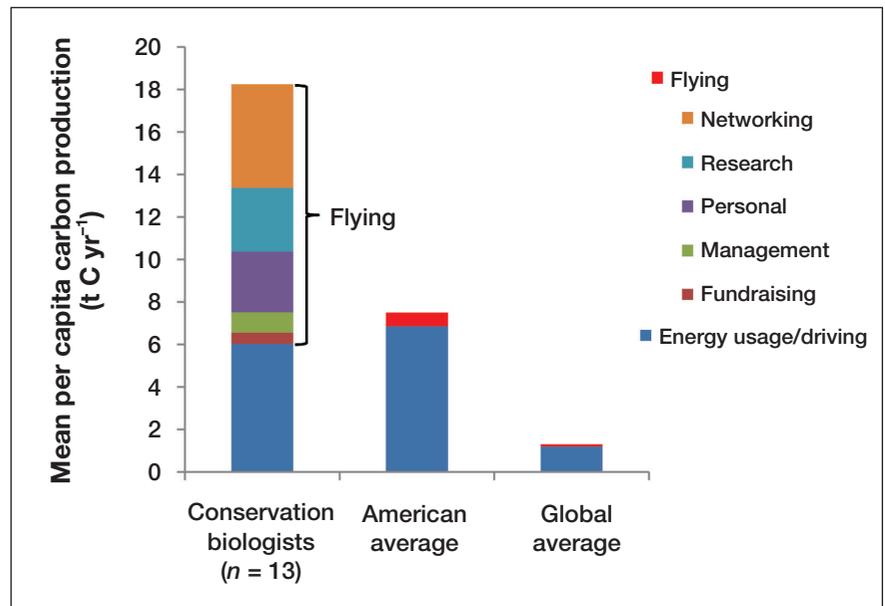


Figure 1. Estimated average annual per capita carbon footprint from transportation and home energy use for a sample of conservationists and Americans (WebPanel 1), as well as global citizens (WebPanel 2). The conservationists' flights have been further subdivided by category. Variance is large (standard deviation = 6.6 t C yr⁻¹) resulting from differences in proximity of family, specific job demands, and personal choices.

The question for scientists who believe emissions must be reduced is whether we can achieve those reductions while remaining globally engaged in our professions. To address this question, we first asked: “Why do we fly?” Collectively, the reasons for our flights fell into five broad categories. Networking (eg attending conferences and external meetings) and research were by far our largest reasons for flying, followed by personal, management (eg internal organizational meetings, grant review panels, etc), and fundraising (Figure 1). These categories are likely to apply to all scientists globally, albeit in varying proportions, depending on the field. Not surprisingly, no two scientists are the same, and there will not be a one-size-fits-all solution to reducing individual carbon footprints. However, flying in our professional lives occurs for both well justified and poorly justified reasons (Table 1). While organizations and individuals can find their own ways to reduce the amount of travel without needing these definitions, we propose general solutions that can reduce air travel through better discipline and

more efficient prioritization (Table 1). Any categorization such as ours has shades of gray, will likely differ among sectors, and may change depending on factors such as career stage. But because air travel is the single greatest source of carbon emissions for many scientists, individual and institutional reductions in air travel will have immediate and important impacts.

The largest reduction could be achieved if individuals attend – and institutions hold – fewer meetings. As is already happening with many businesses (James and Pamlin 2009), the scientific sector should further invest in and demand increased video conferencing to reduce in-person meetings. Moreover, tools to facilitate coordinating conferences temporally and geographically to minimize travel already exist in simplified form (eg www.meetomatic.com; www.doodle.com), and could be enhanced (eg Primerano *et al.* 2008). Research trips can be reduced by establishing collaborations and empowering others to assist in investigations, lead on sub-projects, and send data digitally. For flights that cannot be eliminated, carbon offsets are an option.

Although these changes are relatively simple, they have enormous potential to reduce carbon emissions in the scientific community. If the 10 000–12 000 members of the Ecological Society of America (www.esa.org/member_services/) or the Society for Conservation Biology (www.conbio.org/join/) – assuming the members of both organizations have footprints comparable to ours – collectively reduced their travel by 30%, it could result in reductions of ~42 000 tons of carbon per year ($t\ C\ yr^{-1}$). That is the equivalent of taking ~7300 cars off the road for a year (www.epa.gov/RDEE/energy-resources/calculator.html) or eliminating 172 Boeing 747 US–Europe transatlantic flights.

Institutional changes to reduce flying are beginning. For example, The Nature Conservancy (TNC) reduced trustee meetings from annual to biennial events and reduced science leadership meetings from three to one per year. These changes have not compromised either activity. Similarly, the World Wildlife Fund (WWF) has pledged a 10% reduction in business-related flights. We urge others to do the same and more. Because the environmental impact of flying is very large, small changes in how we conduct our private and professional lives, leading to fewer flights, will substantially reduce carbon emissions.

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Table 1. Our assessment of well justified (1) and poorly justified (2) reasons for flying, along with suggestions (3) for how institutions can institute policies to reduce travel for these reasons

(1) Well justified reasons to fly

To network with a large group of professional colleagues in a specific area and limited time period, thus eliminating the need for multiple trips to see individual colleagues.
To develop a relationship for fundraising or professional partnership.
To build a sense of team, with new collaborators or colleagues.
To work closely together over an extended time period.
To conduct field research that cannot be done any other way.

(2) Poorly justified reasons to fly

To ensure you actually do the work involved in the project or give it your full attention.

To ensure you are “in the loop” and do not miss any key discussions or sub-texts, or to ensure that your ideas will be given as much weight as competing ideas brought in person by others.

To meet with a group you know well (including flying as part of a large group of your in-house colleagues).

To symbolize that the topic is important.

(3) Institutional solutions

Enforce deadlines, encourage reasonable work commitments and better self-discipline.

Require participation in video conferencing to “level the playing field”. Establish clear and disciplined decision-making processes (consensus, vote, senior manager/leader under advice of group) so that the role of personal interactions is minimized.

Meet less frequently and work as “virtual teams”. Provide online forums for important discussions and improve other forms of communication, such as electronic newsletters.

Do not require symbolism to establish importance, but rather have a clear priority system that highlights importance.

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