

## CORRESPONDENCE:

## Long history of IAM comparisons

**To the Editor** — We agree with the point made in a recent Editorial in this journal<sup>1</sup> that the assumptions behind models of all types, including integrated assessment models (IAMs), should be as transparent as possible. However, it is incorrect to imply that the IAM community is just “now emulating the efforts of climate researchers by instigating their own model inter-comparison projects.”

In fact, model comparisons for integrated assessment and climate models followed a remarkably similar trajectory. Early general circulation model (GCM) comparison efforts<sup>2</sup> evolved to the first Atmospheric Model Inter-comparison Project (AMIP), which was initiated in the early 1990s<sup>3</sup>. Atmospheric models developed into coupled atmosphere–ocean models (AOGCMs) and results from the first Coupled Model Inter-Comparison Project (CMIP1) became available about a decade later<sup>4</sup>.

Results of first energy model comparison exercise, conducted under the auspices of the Stanford Energy Modeling Forum, were published in 1977<sup>5</sup>. A summary of the first comparison focused on climate change was published in 1993<sup>6</sup>. As energy

models were coupled to simple economic and climate models to form IAMs, the first comparison exercise for IAMs (EMF 14; <https://emf.stanford.edu/projects>) was initiated in 1994, and IAM comparison exercises have been ongoing since this time<sup>7–10</sup> — and were recently assessed in the latest IPCC report<sup>11</sup> — including a publicly accessible database of scenarios (<https://secure.iiasa.ac.at/web-apps/ene/AR5DB>). □

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## CORRESPONDENCE:

## Strategies for changing the intellectual climate

**To the Editor** — Castree *et al.*<sup>1</sup> are correct that a ‘single, seamless concept of integrated knowledge’ cannot do justice to the diversity of meanings that need to be brought to bear in addressing the challenges of global environmental change. We also agree with them that environmental social sciences and humanities (ESSH) can make important contributions to global environmental change (GEC) science. However, their charge that we ignore the full range of anthropological contributions to understanding of climate change reflects a misreading of our recent Perspective<sup>2</sup> in this journal, as we only attempted to

discuss a few exemplary strands of the many contributions from anthropology to a richer understanding of climate change (for a more detailed discussion, see our forthcoming edited volume<sup>3</sup>).

Secondly, Castree *et al.* suggest that we are reinforcing the status quo in GEC science and ‘pulling our punches’ by using terms common in Earth systems science (such as system and mechanism). Our use of such terms reflected a strategy to use familiar language to raise awareness of anthropological contributions little known to most GEC scientists, along the lines of the ‘clumsy solutions’ proposed by

anthropologist Steven Rayner<sup>4</sup>. Rayner calls for these solutions to ‘wicked problems’ such as climate change — problems marked by deep underlying conflicts about the nature of the problem itself — because they can allow different actors to work together without sharing ethical or epistemological principles. We agree with Castree *et al.* that other strategies are possible, but not that theirs is the only route to a wider dialogue.

Castree *et al.* focus on three texts to illustrate how GEC scientists evoke the notion of seamless, totalizing knowledge. They single out the use of terms such as ‘integration’ in discussions of knowledge to

be considered in GEC analyses and policy decisions. By contrast, we interpret at least some of these texts and their authors as facilitators of a genuine opening for ESSH perspectives and contributions, not least the cited passage from the 2012 'State of the Planet Declaration'<sup>5</sup>. In our view, it would not have made a difference if the declaration's authors had used the words 'inclusion' rather than 'integrate' when calling for consideration of a broad range of knowledges, including indigenous ones. It is not at this superficial level of language choice that the real politics reside. Moreover, some of the authors criticized by Castree *et al.* have been central in creating the opening of the GEC science agenda represented by Future Earth, an evolving 10-year research programme and platform for international engagement fully launched in 2014 to produce more action-oriented knowledge for an equitable transformation to environmental sustainability (<http://www.futureearth.org>). In fact, Future Earth recognizes and solicits contributions not only from the natural sciences and ESSH but also from professions such as law, engineering and medicine.

We agree with Castree *et al.* that the sustainability challenge requires moving beyond the long-standing, exclusionary emphasis on Earth system numerical modelling to inclusion of a broader variety of approaches to the study of GEC, and that a diverse range of thus far largely overlooked

approaches from ESSH is crucial. The problem is that Castree *et al.* misfire in their choice of targets. A more obvious and justified target for their criticism is the international group of geoscience funders united under the Belmont Forum, assisted by the International Council of Science (ICSU). Even after the development of a much more inclusive research agenda under Future Earth, the Belmont Forum's website (<https://www.igfagr.org/belmont-challenge>) singularly promotes an overarching "seamless, global Earth System Analysis and Prediction System". Moreover, it presents as the best articulation of "a funders' vision for the priority knowledge and capabilities derived from environmental research that society needs" a White Paper that acknowledges its own proposed research agenda as "conspicuously" lacking in "socio-environmental research dimensions," concentrating its priority list of "critical interventions" instead on model predictions at regional and decadal scales<sup>6</sup>. With more careful and informed aim of their otherwise justified critique, Castree *et al.* would more effectively nurture an intellectual climate that is sufficiently permissive to build coalitions with sympathizing GEC scientists and ESSH scholars. □

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CORRESPONDENCE:

# Power in climate change research

**To the Editor** — Castree *et al.*<sup>1</sup> are absolutely correct that we need to change the intellectual climate surrounding climate change. Research targeted at guiding senior decision-makers is especially in need of an overhaul<sup>2</sup>. But, although such research may well require far greater collaboration and a "wider dialogue"<sup>3</sup>, a critical perspective requires far more than an 'add-in'. Instead of simply celebrating boundary-crossing as an end in itself, we need to think carefully about who is involved in collaboration and to what end. All paradigms and collaborations are not equal when it comes to climate change or social outcomes.

For newcomers, the existing climate change research landscape they may be invited to traverse is far from even<sup>3</sup>.

Although their participation in climate change discussions may create the appearance of a wider dialogue, their perspective is likely to remain marginal if it challenges existing problem framings<sup>4</sup>. The form of much qualitative social science and humanities knowledge is also incommensurate with the prevailing positivist logic<sup>5</sup>. Important meaning (and critiques) can be lost if such knowledge is inappropriately made to 'integrate' with other dominant forms<sup>6</sup>.

More problematically, the admirable ideal of broadening perspectives and pluralizing action can inadvertently support a wide, but dangerously thin, eco-modernist worldview<sup>7</sup>. In such an approach, climate change is habitually

viewed as a pro-growth opportunity and fundamental change of the sort needed<sup>8</sup> is eschewed. Such an approach also tends to constrain the role of researchers to simply displaying options to those in power<sup>9</sup> regardless of the depth of their understanding or concern. Eco-modernism is associated with the incremental 'clumsy solutions' approach<sup>8,10</sup> that Castree *et al.* express support for alongside their calls for widening dialogue. Whether motivated by an eco-modernist worldview or not, on its own this approach risks inadvertently legitimizing a response to climate change based less on available knowledge, possible outcomes or justice considerations than on the existing preferences of those in power on the day.