

If we are to collectively adapt to the very uncomfortable position we are now in as the first climate change generation, social science and humanities scholars are not the only ones who need to 'get out of their comfort zones', as Castree *et al.* encourage. Because if we are to achieve genuinely informed and effective engagement on climate change, changing the intellectual climate requires critically

assessing, not simply adding to, prevailing knowledge frameworks. □

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## Reply to 'Strategies for changing the intellectual climate' and 'Power in climate change research'

**Castree reply** — Although they challenge some of our claims<sup>1</sup>, Myanna Lahsen and colleagues<sup>2</sup> and Lauren Rickards<sup>3</sup> agree with us that a new intellectual climate ought to prevail in the world of global-change science. We concur with Lahsen *et al.*<sup>2</sup> that there are other (perhaps better) examples than those that we chose to illustrate the tendency of global change scientists to presume that a 'single, seamless concept of integrated knowledge' is realizable and desirable<sup>1</sup>; Paul Palmer and Matthew Smith provide a recent case in *Nature*<sup>4</sup>. We apologise if we misrepresented Barnes *et al.*<sup>5</sup>, and applaud the recent efforts of Barnes and Dove to detail how anthropology can help us better understand climate change<sup>6</sup>.

### We need not only a new social contract for such science but a new kind of science in the bargain.

However, while a few geoscientists sympathetic to the wider environmental social sciences and humanities (ESSH) will certainly help change the intellectual (and associated policy) climate, the challenge is deeper and wider than Lahsen *et al.*<sup>2</sup> acknowledge. First, many social scientists interested in the 'human dimensions' of environmental change lack understanding of, or even interest in, the critical and interpretive traditions of ESSH subjects. For instance, a recent high-profile manifesto for interdisciplinary energy studies brackets essential questions of social power, cultural conflicts, spiritual beliefs and the like<sup>7</sup>. It implicitly aligns social science with attempts to progressively 'green' current energy systems while ignoring the core concerns of the

environmental humanities. Second, very many ESSH researchers who could help geoscientists, policymakers and others reframe the 'problem' of anthropogenic environmental change are disconnected from the networks and forums where ideas get translated into public debates and ultimately into actions. They speak to, and write for, like-minded academics and their students but rarely involve themselves in things like Future Earth<sup>8</sup>. This partly reflects established divisions of academic labour that both separate researchers and attach varied levels of prestige to their respective endeavours.

Strategically, then, many ESSH researchers need to change their own practices, and in the process will help global change science to become a new kind of interdisciplinary endeavour that more richly attends to human dimensions. Global environmental change is indeed a 'wicked problem'. But the true meaning of this for research, social discourse and policy will surely be lost unless enough willing geoscientists and ESSH scholars can together alter their *modus operandi*. Recent critiques of geoengineering from within global change science<sup>9</sup> suggest a persistent externalization of moral, affective and aesthetic issues. As Hulme<sup>10</sup> argues, we need not only a new social contract for such science but a new kind of science in the bargain, one better able to juggle empirical, technical, political, ethical and other matters at the same time.

We are less sanguine than Lahsen *et al.*<sup>2</sup> about politics of language when trying to build intellectual bridges. You do not learn to think in a new vocabulary until you learn to speak it: many of the insights of the ESSH cannot be recoded into the language of natural science without loss. There is important work not just in opening the door to ESSH in the geosciences, but deconstructing science envy (or undue deference to science) in ESSH disciplines. □

As part of this, we need a new lingua franca that will allow the stuff of science and technology (for example, measurement, evidence, explanation, prediction, and control) to be understood as inextricably intertwined with politics, morality, aesthetics and more besides.

This new vocabulary would reflect and reinforce the sort of 'wide, deep and plural interdisciplinarity' that my colleagues argue for in our paper<sup>1</sup>. Lauren Rickards' sentiments<sup>3</sup> are ones we share, so it's puzzling she took the concept of 'values-means-ends-packages' to refer to an 'additive' approach where ESSH is bolted on to existing approaches in global change science. Indeed, I have recently tried to sketch the contours of an alternative approach that articulates geoscience, social science and the humanities in heterodox ways<sup>11</sup>. Unlike some previous attempts<sup>12</sup>, this approach needs to be developed dialogically among geoscientists and ESSH researchers so that vocabularies, research aims and research outputs are genuinely collective. □

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