

CORRESPONDENCE:

# Challenging convention

**To the Editor** — Parmesan and co-authors<sup>1</sup> offer a welcome tonic to overstated claims that attribute various localized changes in biological systems to human-induced climate change. However, their Commentary is off target when it lays blame for the misguided focus on attribution on the Intergovernmental Panel on Climate Change (IPCC) “effectively yield[ing] to the contrarians’ inexhaustible demands for more ‘proof.’” As compelling as battle with the sceptics seems to be in virtually every aspect of the climate issue, the overstated role of attribution in the climate debate has a far more prosaic origin in the fundamental design of the Framework Convention on Climate Change.

The Climate Convention defines ‘climate change’ narrowly, as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability over comparable time periods.” Under this definition, the very existence of ‘climate change’ depends on the ability of the scientific community to attribute change to human activity<sup>2</sup>.

The Climate Convention goes further, and in its Article 2 establishes a threshold for action — to stabilize “greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous atmospheric interference with the climate system.” Attribution is necessary to help delineate where danger lies. Without attribution to specific biological, human and other impacts that people care about there would be no basis for action under the formal logic of the convention.

To the extent that the IPCC sees its activities as being in support of the Climate Convention<sup>3</sup>, there will be continuing demands, both explicit and implicit, to emphasize the impacts of greenhouse-gas emissions on specific biological systems and to downplay or even ignore other important drivers of change. This emphasis is only logical as the Climate Convention is poorly positioned to influence this broader set of drivers.

An obvious solution to this quandary would be to recast the Climate Convention explicitly on emissions of long-lived greenhouse gases rather than on ‘climate change’ *per se*. Meanwhile, the climate

science community would do well to recognize that the important work that they do is deeply and inevitably influenced by such mundane political considerations. Rather than avoiding this reality, the IPCC would be well served to situate itself more directly with respect to policy options, and to openly discuss the implications of policy design for the scientific community. Parmesan and co-authors tell us that, in one respect at least, the political framework for action on climate change asks biological scientists to do the impossible. □

References

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CORRESPONDENCE:

# The value of attribution

**To the Editor** — The Commentary by Parmesan and co-authors in the April 2011 issue of *Nature Climate Change*<sup>1</sup> argues that attribution studies to evaluate the impacts of anthropogenic climate change are ill-advised. We disagree — on the contrary they are essential for credible prediction of future impacts. Regional and local attributions make a remote concern — that of long-term global climate change — relevant on a scale that the public and policymakers can relate and respond to. Such studies are difficult and, as in any new area of science, opinions differ about the best way forward. We agree with Parmesan and co-authors that “it is rarely possible to attribute specific responses of

individual wild species to human-induced climate change”, but attempts to do so<sup>2,3</sup> are nevertheless valuable.

Parmesan and co-authors are concerned that attribution studies will divert resources from urgent work on adaptation. But this is not a zero-sum game — credible regional and local attribution will stimulate resourcing of both attribution and adaptation. A home-owner confronted by flood damage, alteration of local ecosystems and potential loss of equity may demand attribution studies as well as increased individual and public efforts in adaptation and mitigation<sup>4</sup>. Detailed, quantified attribution helps target adaptation more effectively<sup>5</sup> and

may also counter recent tendencies to over-attribute, a phenomenon shown by the range of human and resource problems brought to the United Nations Climate Change Conference in Copenhagen in 2009. Climate change should not mutate from an inconvenient truth into a convenient scapegoat for other human pressures. Indeed, we agree that managing other stressors on biological systems provides a robust no-regret strategy with benefits for climate adaptation and other goals<sup>6</sup>, a view that seems widely accepted<sup>7</sup>.

Increasingly, scientists are responding to demands for predictions of regional climate impacts<sup>8</sup>, but with insufficient

attention to the quality of predictions<sup>9</sup>. Recommending that predictions should where possible be accompanied by attribution studies would encourage researchers to confront the difficulty of attribution. Identifying processes and modelling them with sufficient power to detect the signal of anthropogenic climate change in observations of natural systems should be the goal, and would provide the basis for estimates of confidence in predictions. Predictive models of biological systems should be capable of reproducing observed changes with a reasonable level of skill. Failure to do so undermines their credibility, particularly where past variations in environmental drivers, such as temperature or vertical ocean mixing, are comparable in magnitude to expected future changes due to anthropogenic climate change.

Finally, the authors' proposition that biologists are now expected to change their

research focus in response to contrarian arguments might be taken seriously if such arguments had scientifically tractable content. The guidance paper by the Intergovernmental Panel on Climate Change<sup>10</sup> cited by the authors contains no recommendation concerning the need for more attribution studies or what form they should take — a remarkable omission if the panel is indeed trying to set an agenda. □

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## CORRESPONDENCE:

# Tried and tested

**To the Editor** — Parmesan and colleagues<sup>1</sup> claim that the Intergovernmental Panel on Climate Change (IPCC) “advocates an ever-more-detailed approach to attribution” in a guidance paper for its fifth assessment report, and that applying this approach to biological systems “effectively yields to the contrarians’ inexhaustible demands for more ‘proof’ [of human-induced climate change], rather than advancing the most pressing and practical scientific questions.” Although we welcome the scientific debate on this issue, we provide some background to this topic from the IPCC Working Group I to address these assertions.

The question of whether an observed change is caused by human activities is among the most often asked by the public, and is of immediate relevance to policymakers: planning for the future requires consideration of the climate forcing due to human-induced factors and the impacts associated with it. Therefore, scientists are called on to investigate this issue with all the tools available.

Detection and attribution — enabling the quantitative distinction between anthropogenic climate change and natural climate variability — has become

a robust and well-tested methodology in climate science with a growing body of relevant peer-reviewed literature<sup>2</sup>. Some major statements in the Working Group I contributions to the third and the fourth assessment reports of the IPCC were based on it, and it will also be emphasized in the IPCC’s fifth assessment report in both Working Groups I and II, with Working Group I devoting an entire chapter to detection and attribution at global to regional scales.

To support the scientific community engaged in the assessment process, IPCC Working Groups I and II jointly held an IPCC expert meeting on ‘Detection and Attribution Related to Anthropogenic Climate Change’ in September 2009. The meeting goal was to develop consistency and coherence of terminology used in detection and attribution studies, in particular where they extend to impact-relevant climate change, for example, detection and attribution of extreme events or changes in the carbon cycle and in ecosystems.

The product of this meeting was a ‘Good Practice Guidance Paper’<sup>3</sup>, summarizing the discussions and clarifying methods, definitions and terminology across the IPCC Working Groups. It is a carefully

formulated document, jointly authored by scientists from the physical sciences and from the impacts and ecosystem research communities, and in no way makes recommendations on research needs. It is fully in line with the mandate of the IPCC, which is to comprehensively assess the available science while not performing or promoting specific science. □

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