The role of values in climate science

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Science provides society with information that helps solve the ethical, societal and social implications of climate change, the most urgent and far-reaching global problem of our time. Owing to the complexity of the problems that arise, they are not solved with knowledge or one responsible goodwill alone, but often require value judgements, for example, decisions on the relative importance of different stakeholders. Interdisciplinary scholarship, first of all, philosophy of science, argues that some of these and other value judgements can already play a role in the scientific process that both produces such information and that develops more foundational scientific tools, methods, and results underlying it.

Here, it is argued that it is time for the scientific community itself to become more aware of, acknowledge, and discuss the role of values, to enable their effective management and thus make science observe its responsibility to society even better. The state of the debate in climate science as represented by the latest assessment report by the Intergovernmental Panel on Climate Change is summarised. Examples from the recent philosophical literature are given that illustrate value influence beyond that acknowledged in the report. Key messages are suggested to the scientific community as to how the topic of values could be progressed, including strategies such as transparency and diversity, cross-disciplinary cooperation and education besides, and aiding, the fostering of awareness by individual scientists in their research.

As an attempt to advance and illustrate this awareness and acknowledgement of values from a scientist perspective, a case study is further presented. There, value judgements are identified that are relevant to multi-model based assessments such as those performed until recently for climate sensitivity and still in use for various other climate metrics. The whole series of assessment steps is considered, from choosing the research question over model building, deriving the metric of interest, and combining model results to publishing and communicating the findings. It is discussed that neither sensitivity studies nor the use of multiple, other lines of evidence instead of model estimates provide a way to avoid value judgements, hence not diminishing the need for reflection on values. While especially timely now in climate science, the question of value acknowledgement and management more generally applies to any science, including other areas of geosciences that are similarly addressing questions of high societal relevance.