

THE STRENGTHS AND WEAKNESSES OF DIFFERENT CLIMATE MODELS: PROVIDING GUIDANCE TO POLICYMAKERS AND IMPACT ANALYSTS

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HUMAN-CAUSED CLIMATE CHANGE is not a hypothetical future event. It is real, and we are experiencing it in our lifetimes. Despite compelling evidence of human effects on global climate, there is a continuing need for scientists to explain “how we know it’s us”. The first part of my talk will briefly summarize the scientific underpinning for “discernible human influence” conclusions of the Intergovernmental Panel on Climate Change. I will show that the climate system is telling us an internally- and physically-consistent story. The message in this story is that observed changes in many different (and independently-measured) aspects of the climate system cannot be explained by natural causes alone.

Studies of the causes of climate change frequently rely on computer models of the climate system. Such models are the only tools we have for attempting to understand the size (and geographical and seasonal distribution) of the climate changes we are likely to experience over the 21st century. But not all computer models show equal skill in capturing key features of present-day climate. Should models with higher skill in reproducing today’s climate be regarded as more trustworthy predictors of 21st century climate change? Is it easy to identify the “top 10” climate models in the world? How should decision-makers – and scientists interested in studying the impacts of climate change – use and interpret information on the strengths and weaknesses of different climate models? Can we find clever ways of reducing uncertainties in projections of future climate change? These are a few of the questions that will be addressed in the second part of my talk.