

Climate change: a profile of US climate scientists' perspectives

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Abstract Climate scientists have played a significant role in investigating global climate change. In the USA, a debate has swirled about whether a consensus on climate change exists among reputable scientists and this has entered the policy process. In order to better understand the views of US climate scientists, we conducted an empirical survey of US climate scientists ($N = 468$) in 2005, and compared the results with the 2007 Intergovernmental Panel on Climate Change (IPCC) physical science report and policy summaries. Our results reveal that survey respondents generally agree about the nature, causes, and consequences of climate change, and are in agreement with IPCC findings. We also found that there is strong support for a variety of policy initiatives to reduce greenhouse gas emissions.

1 Introduction

Few issues have been more discussed, debated, or used to support policy positions and political action than the presumed beliefs of US climate scientists on the existence, causes, and likely effects of global climate change. The competing assertions that there is or is not consensus among most scientists on the severity, causes, likely effects, and need for action regarding climate change have been at the center of a US

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policy debate for the past several years. Those who see the problem as real, caused by human activity, and in need of decisive action argue that US scientists are in agreement that the science is clear and overwhelmingly supportive of their position. Those who disagree that the problem is acute or in need of decisive action like to note points of disagreement among scientists to bolster their position that the science is unsure and not defined enough to use as a foundation for policy decisions. This latter position has had some success, as recent public opinion polls indicate that the public believes that scientists do, in fact, disagree about this topic and that this perceived disagreement increases public uncertainties (ABC News/Washington Post/Stanford Poll 2007).

Where have the two sides of the debate obtained their information about the consensus, or lack thereof, among US climate scientists? Those who argue that scientists are sure that climate change is real, caused by human activity, and in need of strong action point to comprehensive reviews of years of scientific research compiled, evaluated, and reported by respected scientific bodies like the Intergovernmental Panel on Climate Change (IPCC 2007a, b), the National Academy of Sciences (2006), the National Research Council (2007), and the Scientific Expert Group on Climate Change and Sustainable Development (2007). Opponents to these scientific reviews point to specific disagreements of selected scientists such as Richard Lindzen and Patrick Michaels (Lindzen 2007a, b; Michaels 2004, 2005), to the reasoning of some politically motivated think tanks: the George C. Marshall Institute; the Competitive Enterprise Institute; the Heritage Foundation; and the Cato Institute (Michaels 2004, 2005; Schaefer and Lieberman 2007; Lewis 2007), and individual public officials, such as former NASA chief, Michael Griffin (2007).

However, neither side of the debate has direct, empirical information from US climate scientists on how these scientists frame and understand the climate change problem and the science surrounding it. Our study seeks to clarify the debate by providing this information.¹

2 Research methods

We conducted a multi-modal survey of US climate scientists between March and September 2005.² The sample frame used to identify climate scientists included

¹Although Bray and von Storch conducted a survey of climate scientists in 1996, our different approaches to the topic do not allow comparison (Bray and Krück 2001).

²We opted for a multi-modal (web-based survey, phone survey and mail/fax survey) survey strategy for two reasons. First, we wanted to provide climate scientists with many options to accommodate busy schedules—professional communities are notoriously difficult to survey representatively (Gore-Felton et al. 2002). Second, survey methodology literature indicates that multi-modal surveys produce similarly valid and reliable results across modal type (Smith et al. 2007; Burkey and Harris 2006). In addition, we screened data to test for statistically significant differences on survey responses by modal type. We compared probability distributions of survey items by response modes (web-based versus other) using the Mann–Whitney U test (for ordinal measured variables). With only one exception—the question pertaining to the extent to which climate scientists understand global climate change, where web-based survey takers had significantly lower scores ($z = -2.83$, $p = .000$) than other takers—distributions of survey items exhibited no significant differences between response modes with regard to central tendency or dispersion. Results suggest that no significant differences exist between the data collected by either modality, and that respondents are drawn from the same population.