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Global warming skeptics often fall back on the argument that the scientific case for global warming is all model predictions, nothing but simulation; they warn us that we need to wait for real data, "sound science." In A Vast Machine Paul Edwards has news for these skeptics: without models, there are no data. Today, no collection of signals or observations_even from satellites, which can "see" the whole planet with a single instrument_becomes global in time and space without passing through a series of data models. Everything we know about the world's climate we know through models. Edwards offers an engaging and innovative history of how scientists learned to understand the atmosphere_to measure it, trace its past, and model its future.

Edwards argues that all our knowledge about climate change comes from three kinds of computer models: simulation models of weather and climate; reanalysis models, which recreate climate history from historical weather data; and data models, used to combine and adjust measurements from many different sources. Meteorology creates knowledge through an infrastructure (weather stations and other data platforms) that covers the whole world, making global data. This infrastructure generates information so vast in quantity and so diverse in quality and form that it can be understood only by computer analysis_making data global. Edwards describes the science behind the scientific consensus on climate change, arguing that over the years data and models have converged to create a stable, reliable, and trustworthy basis for establishing the reality of global warming.

About the Author

Paul N. Edwards is Associate Professor in the School of Information at the University of Michigan. He is the author of The Closed World: Computers and the Politics of Discourse in Cold War America (1996) and a coeditor (with Clark Miller) of Changing the Atmosphere: Expert Knowledge and Environmental Governance (2001), both published by the MIT Press.