

Big Data and the Science of the Anthropocene

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By Lizzy Hare

In her September Section News Column, "[Anthropology and the Anthropocene](#)," Amelia Moore made a distinction between anthropology *in* the Anthropocene and anthropology *of* the Anthropocene. The distinction is made between those who research the effects of global change and those who investigate the concept of the Anthropocene as a social process. My own research related to the Anthropocene is not on the effects of climate change. Rather, it focuses on the process of establishing credibility, authority, and trust through scientific knowledge. I am following the process of developing an ecosystem forecast model. This model will provide land managers and policy makers with predictions about landscape and vegetation responses to climate change. Following the model's development serves as an entry point for exploring what counts as credible scientific knowledge about climate change, who gets to decide what counts, and how credibility is determined. It is fair to describe my research as "anthropology of the Anthropocene." However, framing it in this way makes it too easy to neglect the generative nature of the Anthropocene as a concept.

As it is used colloquially, the Anthropocene carries heavy connotations of destruction and degradation, and I do not want to discount the serious environmental consequences of global change, or the inequitable distribution of their effects. But the Anthropocene as a concept also has political and technological consequences. Scientists and policymakers who wish to understand, predict, and manage the consequences of this new anthropogenic geological epoch have pushed forward tremendous innovations in science and technology. The Anthropocene is thus not only about unprecedented human impact on the planet, but also about unprecedented changes in technology, such as the rise of global connectivity and computing power that made "Big Data" possible.

"Big Data" typically refers to massive data sets of quantitative data, often originally collected automatically and for non-specific purposes. Big Data's optimistic supporters claim that they will

be able to revolutionize science by using statistics to mine large sets of data rather than tackling each research question with a different set of methods and tools. While Big Data techniques have led to the success of companies like Google, it remains unclear how or even whether automated data collection and statistical analysis can produce more than large-scale correlations. Recently, however, scientists have been working to develop tools for incorporating Big Data with more traditional empirical data by using simulation models. Scientists are developing this technique for use in climate, weather, and ecological forecast models, as a way to reduce uncertainty in forecasts by constraining them with observed data.

Data assimilation is not the only way that modelers have tried to control uncertainties within climate models. Some political leaders have misconstrued climate science, and it has come under intense scrutiny by multiple government committees following the 2009 “Climategate” scandal. The critics of climate science cite the uncertainties inherent in forecasting as well as concerns that scientists with political agendas manipulate data. This specter hangs over US climate science, and one response has been to develop a quantitative scale for uncertainty in forecasts. This move is grounded in the assumption that quantification is an effective technique for neutralizing information, and it displaces concern and politics on to users of the quantitative information. This is especially attractive when trying to convey information as (potentially) dire as the consequences of climate change.

The Anthropocene as a concept asks us to pay attention to changes in the world around us. These changes have environmental, social, and political impacts. In efforts to understand the environmental changes of the Anthropocene, and to respond to changes in political and social order, both anticipated and actualized, scientists have developed new tools and techniques. Many claim that Big Data techniques are revolutionizing science, but it is probably too early to assess that claim. Techniques for assimilating Big Data into climate models are just one example of technological and scientific developments of the Anthropocene. There are certainly many more. The generative potential of this epoch should be a site for ongoing anthropological inquiry because it has the ability to drastically change the world we live in.

The effects of global change—and thus the scope of anthropology *in* the Anthropocene—will be vast, even more so if we take seriously the impacts that this epoch has had and will have on science and technology. The lived experience of global environmental change is not limited to encounters with environmental catastrophe. New technologies will have consequences for everyone, perhaps especially for those who cannot access them. As anthropologists, we ought to be attentive to what the Anthropocene is capable of producing, not only what it is capable of destroying.

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