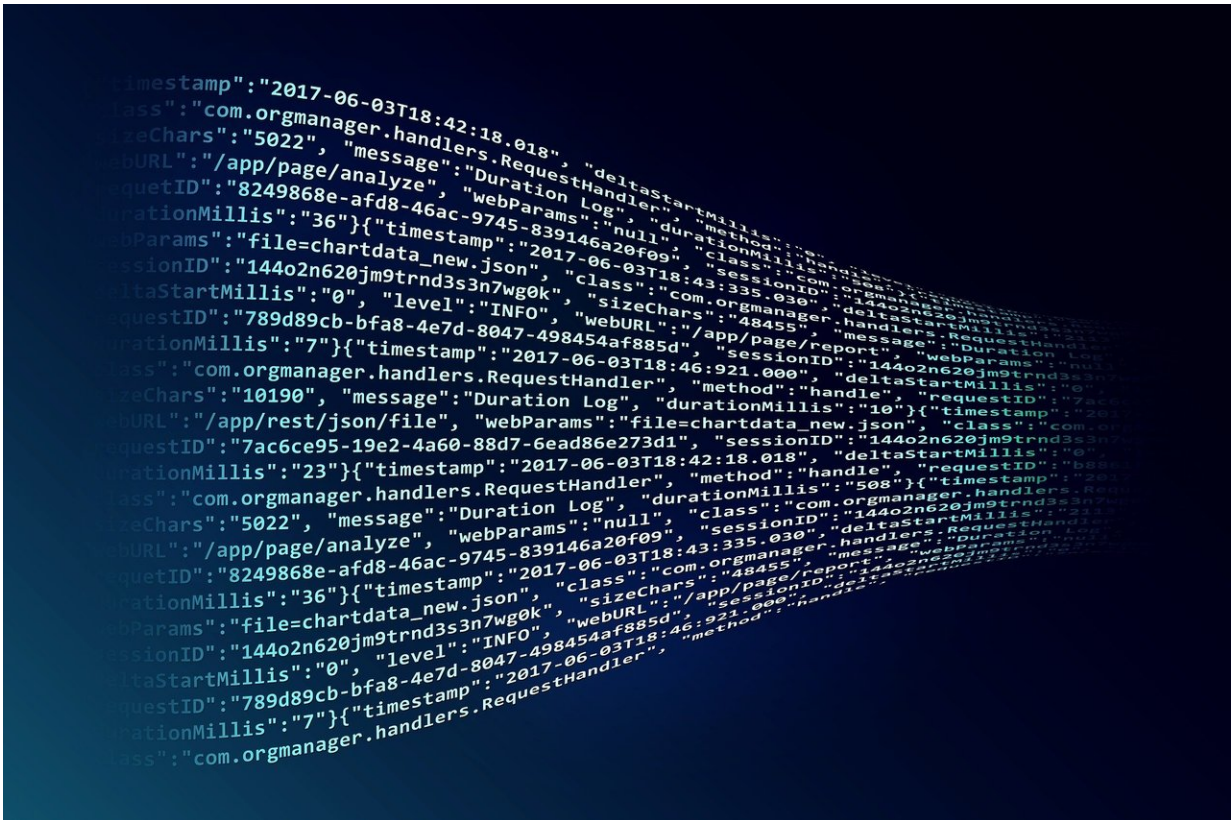


# Building a culture of high-quality data

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The era of big data has inundated nearly all scientific fields with torrents of newly available data with the power to stimulate new research and enable inquiry at scales not previously possible. This is particularly true for ecology, where rapid growth in remote sensing, monitoring, and community science initiatives has contributed to a massive surge in the

quantity and kinds of environmental data that are available to researchers.

Writing in *BioScience*, a team led by US Department of Agriculture ecologist Sarah McCord states that the volume of the data is only part of the story. Just as important, they say, is the quality of the data.

According to the newly published article, "Big data has magnified both the burden and the complexity of ensuring quality data." And a failure to ensure quality data, say the authors, may cause significant problems for science: "Breakdowns in data quality management can have dire consequences for the rigor of inferences drawn from data analyses, our understanding of ecosystems, and the predictive power of models and their uncertainty," which in turn affect real-world management decisions.

To meet these challenges, the authors propose a comprehensive data quality framework with the aim of encouraging best practices among collectors, curators, and users of ecological data. They argue that their proposed approach constitutes an improvement on the broadly used DataOne lifecycle and similar approaches. Key to the proposed framework is that, rather than isolating quality assurance and [quality control](#) at a single stage, it would separate the two and "encourage all ecologists and land managers, who increasingly rely on found data and may not have a personal relationship with the study initiators or data collectors, to participate in ensuring data quality."

In so doing, say the authors, the proposed framework would lead to higher-quality ecological data useful to a greater number of users, with fewer errors among data sets. Although deployment of the proposed framework presents challenges, the authors argue that "the imperative to take these steps is global. The [quality assurance](#) and [quality control framework](#) can enhance existing ecological data and collaboration approaches, reduce errors, and increase efficiency of ecological analysis,

thereby improving ecological research and management."

**More information:** Sarah E McCord et al, Provoking a Cultural Shift in Data Quality, *BioScience* (2021). [DOI: 10.1093/biosci/biab020](https://doi.org/10.1093/biosci/biab020)

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