

# FAIR play in geoscience data

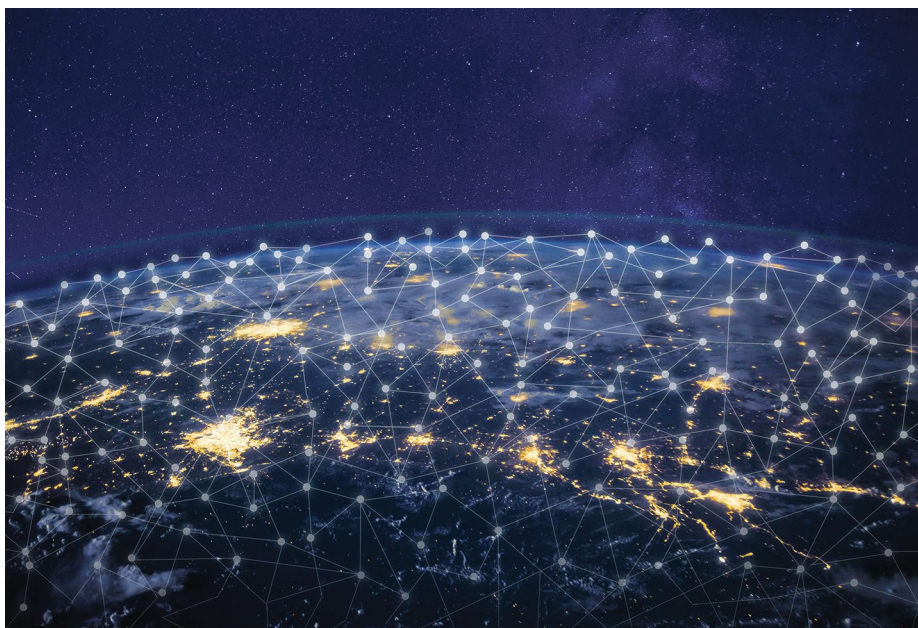
With public demand for reproducible science comes a mandate to researchers to ensure their methods are transparent and their data accessible. *Nature Geoscience* supports these efforts.

**D**ata are the foundation of science. Data are often hard-won at great expense, and in the Earth and planetary sciences, they can come from inaccessible and inhospitable places. We must make the most of this precious resource: data should be shared and compared, reused and reproduced (where that is viable). To facilitate scrutiny of previously published data by researchers working on related questions, the data need to be easy to find, comprehensively described and accessibly stored. To accelerate data publication and sharing, *Nature Geoscience* will join *Nature* and *Scientific Data*<sup>1</sup> in endorsing the principles of the Enabling FAIR Data Project (<https://go.nature.com/2X9Yfnb>) for articles submitted from January 2020 onwards. As such, we will require that our authors make data that support their conclusions available in publicly accessible repositories.

FAIR data are “Findable, Accessible, Interoperable and Reusable”<sup>2</sup>. As such, it will no longer suffice to publish the data that support a *Nature Geoscience* publication solely as Supplementary Information, where they can be hard to discover and harder to reuse. We can consider exceptions, but only if compelling reasons, for example related to ethic or privacy restrictions, are brought to our attention. Editors will guide authors through the process. Those who need further support, for example in finding suitable repositories for their often unique datasets, can also turn to the research data helpdesk for independent advice (<https://go.nature.com/351VNSv>). We will make authors aware of our policy change at an early stage of the publication process, so that they can prepare their data for deposition in a repository in good time.

In addition to supporting the FAIR Data Project, which is aimed at benefitting the scientific community at large, we have also overhauled the way supplementary material is presented. Any enriching information that is not accommodated in the main manuscript has previously been relegated to a separate Supplementary Information file, usually in PDF format. Going forward, we are making a few changes that we hope will make this information more accessible to our readers.

First, we now encourage authors to add editable files containing the data that



Credit: Anna Berkut / Alamy Stock Photo

underlie each of their figures as Source Data files. This applies to everything from simple scatterplots to outputs from numerical simulations; we note that the latter does not fall under the mandate for FAIR data deposition mentioned above. The only limit is file size: Source Data files need to be downloadable in a reasonable amount of time. With this initiative, we are hoping to end the era of having to scrape data points from published figures by hand or algorithm.

Secondly, we now offer up to ten display items of ‘Extended Data’, in line with *Nature*’s article format. These items can be figures or tables, which are displayed alongside the HTML version of the article online to make it easy for readers to toggle between text and Extended Data. They are also included at the end of the downloadable PDF version of the article. Extended Data files are published as non-editable images, but the underlying data should ideally be supplied as Source Data. If the provision of Extended Data, together with the Methods section, can accommodate all the additional material that is needed to support an article, we feel that this is the best option for authors and readers.

For articles that require material outside the main text where figures and tables are integrated with discussion, we continue to offer Supplementary Information. The same applies if more than ten supplementary display items are needed. This format may be best for some articles that include numerical simulations, where validations and sensitivity tests need to be fully documented, or for the description of analytical procedures supported by images and data. Like for Extended Data, data underlying the figures and tables that could be valuable for readers can be included as Source Data.

We hope that this set of changes will enhance the transparency and usability of the articles we publish: scientific progress relies on sound, verifiable foundations. Going forward, we will continue to push for best practice in reproducibility. □

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## References

1. *Nature* **565**, 134 (2019).
2. Wilkinson, M. D. et al. *Sci. Data* **3**, 160018 (2016).