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Modern geoscience publishing

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Viewpoint: Modern geoscience publishing

Olivier Pourret and the EarthArXiv Team contend that preprints can help bring the geosciences into the 21st century.

A preprint is the initial version of a research article, often (but not always) before submission to a journal and thus before formal peer-review. Preprints help modernise geoscience by removing structural barriers that inhibit broad participation in the scientific process, and which are slowing progress towards a more open and transparent research culture.

Preprints are not new; they have been around since the 1960s. In August 1991, a centralized web network, arXiv (<https://arxiv.org/>, pronounced “är kīv”, from the Greek letter “chi”), was established to share physics preprints. arXiv has supported the fields of physics, mathematics and computer science for over 30 years, during which time the pace of dissemination of scientific information has quickened. In recent years, more disciplines – including the geosciences, via EarthArXiv (www.eartharxiv.org/; Narock et al., 2019) and ESSOAr (www.essoar.org) – have started to take advantage of preprints.

Preprints have many well-documented benefits for both researchers and the public (e.g., Bourne et al., 2017; Sarabipour et al., 2019; Pourret et al., 2020). For example, preprints enable:

- Rapid sharing of research results, which can be critical for time-sensitive studies (such as after disasters), as well as for early career researchers applying for jobs, or any academic applying for grants or a promotion, given that journal-led peer review can take many months to years;
- Greater visibility and accessibility for research outputs, given there is no charge for posting or reading a preprint, especially for those who do not have access to pay-walled journals, or limited access due to remote working (such as during lockdowns);
- Additional peer feedback beyond that provided by journal-led peer review, enhancing the possibility of collaboration via community input and discussion;
- Researchers to establish priority (or a precedent) on their results, mitigating the chance of being ‘scooped’;
- Breakdown of the silos that traditional journals uphold, by exposing us to broader research than we might encounter otherwise, and giving a home to works that do not have a clear destination in a traditional publication;
- Research to be more open and transparent, with the intention of improving the overall quality, integrity, and reproducibility of results.

During the COVID-19 pandemic, the medical and broader scientific community, as well as the public, have seen the role for preprints in opening and accelerating the scientific process for the benefit of humanity (Besançon et al., 2021). Preprints are now an established part of the scientific publication and communication process, and are here to stay (Lanati et al., 2021).

Preprints are helping to modernise the geosciences by removing structural barriers that make science and knowledge less accessible to those who often fund knowledge-creation — taxpayers — as well as making research results quickly available to all who might benefit from it.

Olivier Pourret, Christopher Jackson, Samantha Teplitzky, Evan Goldstein, Jess Hillman, and the EarthArXiv team.

Geoscientist, The magazine of the Geological Society of London <https://geoscientist.online/>

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Further reading

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