

Future evolution of open archives for preprints, posters, and presentations as a key component of open science in the Earth and space sciences

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A culture of using preprint servers has been widely established in astronomy, physics, computer sciences, and the social sciences for several decades. Studies of these have shown that sharing of manuscripts on these servers accelerates citations and the pace of science. Further alignment and standardization around this process, and broad cultural adoption would help accelerate these benefits. Servers have been established in other disciplines more recently, and usage has been growing gradually.

Use of preprint servers was slow to catch on in most of the Earth and space sciences, except for disciplines closely aligned with physics and astronomy, although most of the EGU journals are open-review journals and act in many ways like preprint servers. Two open archives were established for the Earth and space sciences in 2017: <http://ESSOAr.org> and <http://EarthArxiv.org>. ESSOAr (Earth and Space Science open Archive) was one of the first major archives to include posters presented at meetings. Uptake of both has been growing gradually; about 5% of posters presented at the 2018 Fall AGU meeting were posted on ESSOAr. Several are also including links to data sets or other resources (e.g., e-posters). Deposition was accelerated by automatic transfer of metadata from the meeting abstract system. Similar automated transfer is nearly implemented from major editorial systems for ESSOAr, BioArxiv and several others servers. This process should accelerate uptake and cultural adoption. Further adoption of standards by the broader community would further help adoption, including permission and encouragement from most journals, citation and credit standards, regularly connecting preprints with ORCID and later publications, broader awareness and adoption of standards on sharing code, data, and samples, and expansion to include oral presentations at meetings as technology improves to include audio and capture presentation information regularly. Support open science by adopting these best practices and archive your posters and draft manuscripts.

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