

Connecting data, software, and peer-reviewed publications: a publisher case study

Kristina Vrouwenvelder (0000-0002-5862-2502)¹, Shelley Stall (0000-0003-2926-8353)¹, Matthew Giampoala (0000-0002-0208-2738)¹, Mia Ricci (0000-0002-8789-0565)¹, **AGU Publications Staff** and **AGU Editors**

¹: American Geophysical Union, Washington, DC USA

About Us

Society publisher of 24 journals across the Earth, space, and environmental sciences, committed to furthering open science and FAIR data and software.

AGU Publications Data and Software Guidance for Authors

- ✓ Data and/or software are deposited in a community-accepted, trusted repository, as appropriate, and preferably **with a DOI**
- ✓ Availability Statement is included as a separate paragraph in the Open Research section explaining to the reader where and how to access the data and software
- ✓ **Citation(s) to the deposited data and software are included in the Reference Section**

Compliance is enforced at re-submission for most AGU journals. The data and software sharing policy is subject to editor discretion and exceptions are made where legal, privacy, sensitivity, etc. restrictions on sharing exist.

Author Questions

Gaps in author/researcher education around data sharing exist as well as infrastructure needs (big data) and standards (discipline-specific metadata).

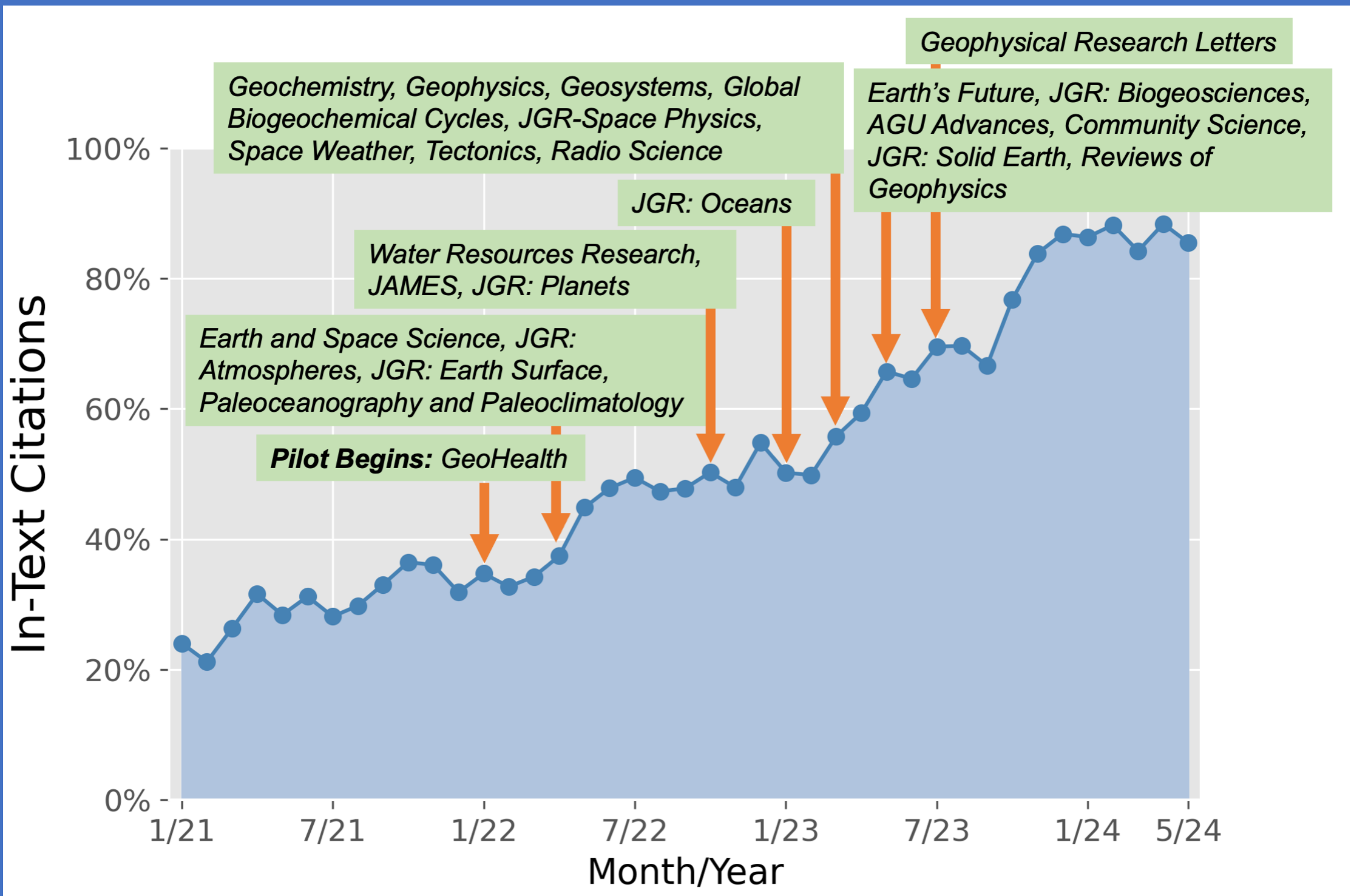
- "Which repository should I use?"
- "Are there recommended data formats for authors?"
- "How should we format data or software citations?"
- "How do I make sure my software is ready to be reused?"
- "What about big data?"
- "Should I share my model/simulation data?"

AGU's full author guidance for data and software citation

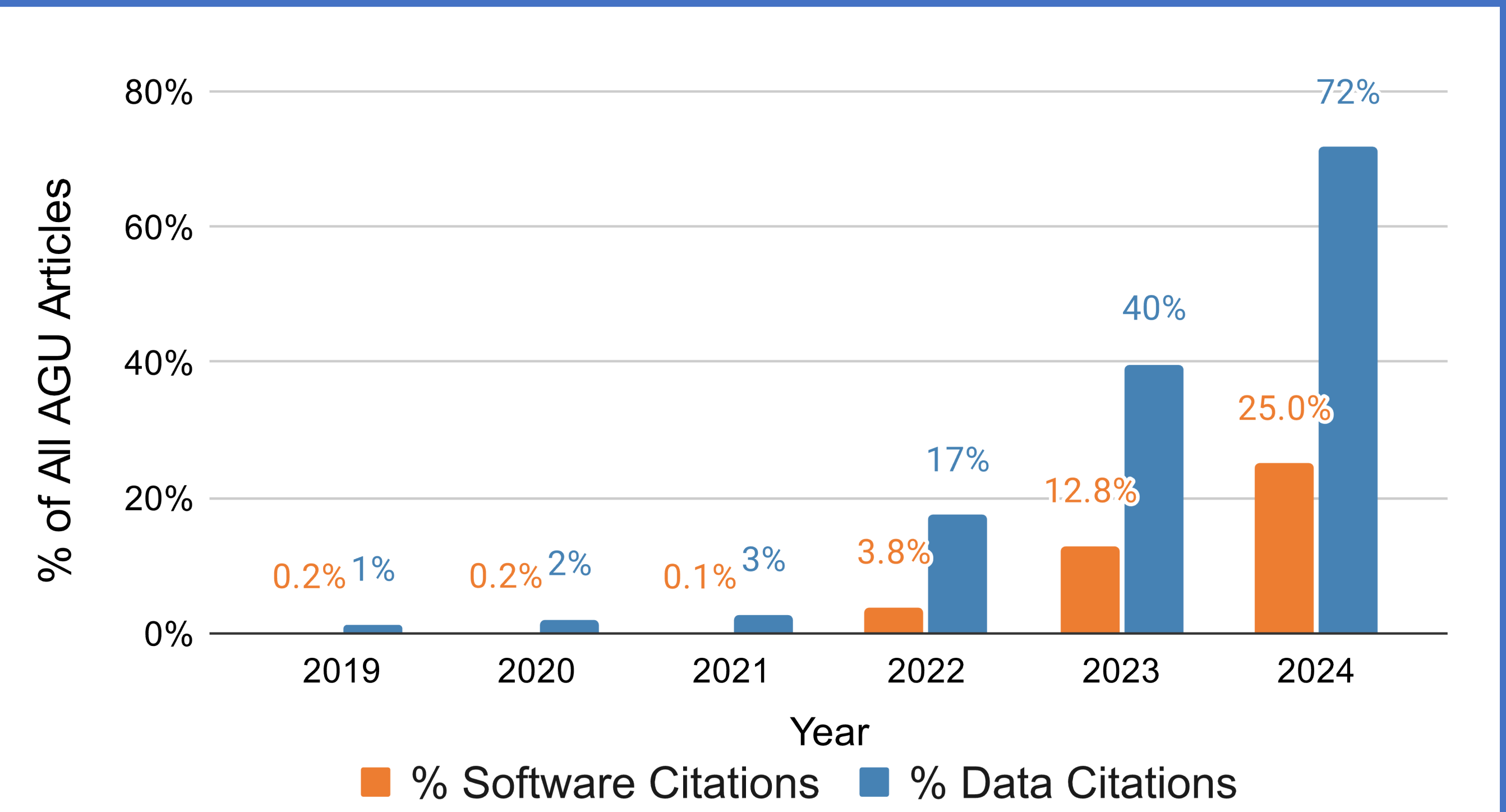
Introduction to Open Science course materials



AGU's Data Citation Pilot

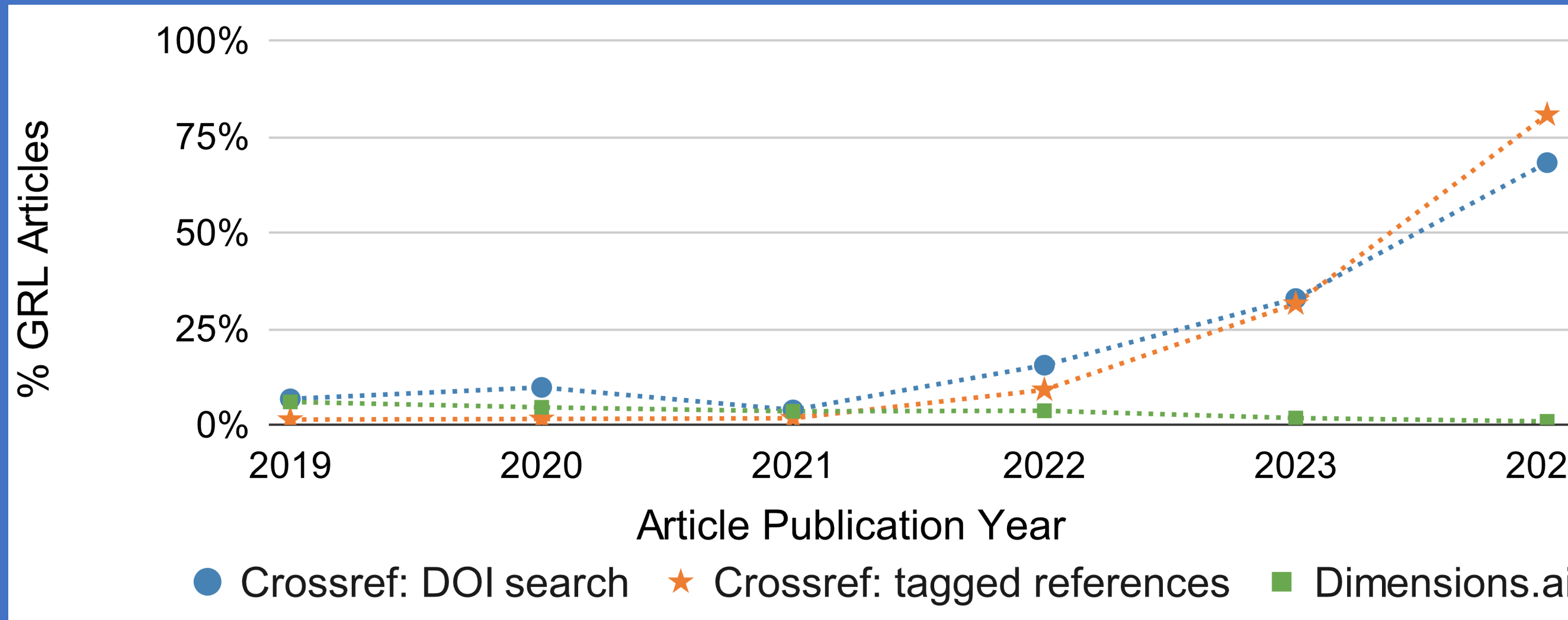


In 2022, we dedicated staff effort to enforcing our data sharing policy. This pilot now includes all AGU journals and greatly increased the % of AGU articles accompanied by a reference, which points to a dataset, data paper, or software, in the Data Availability Statement (Open Research Section).

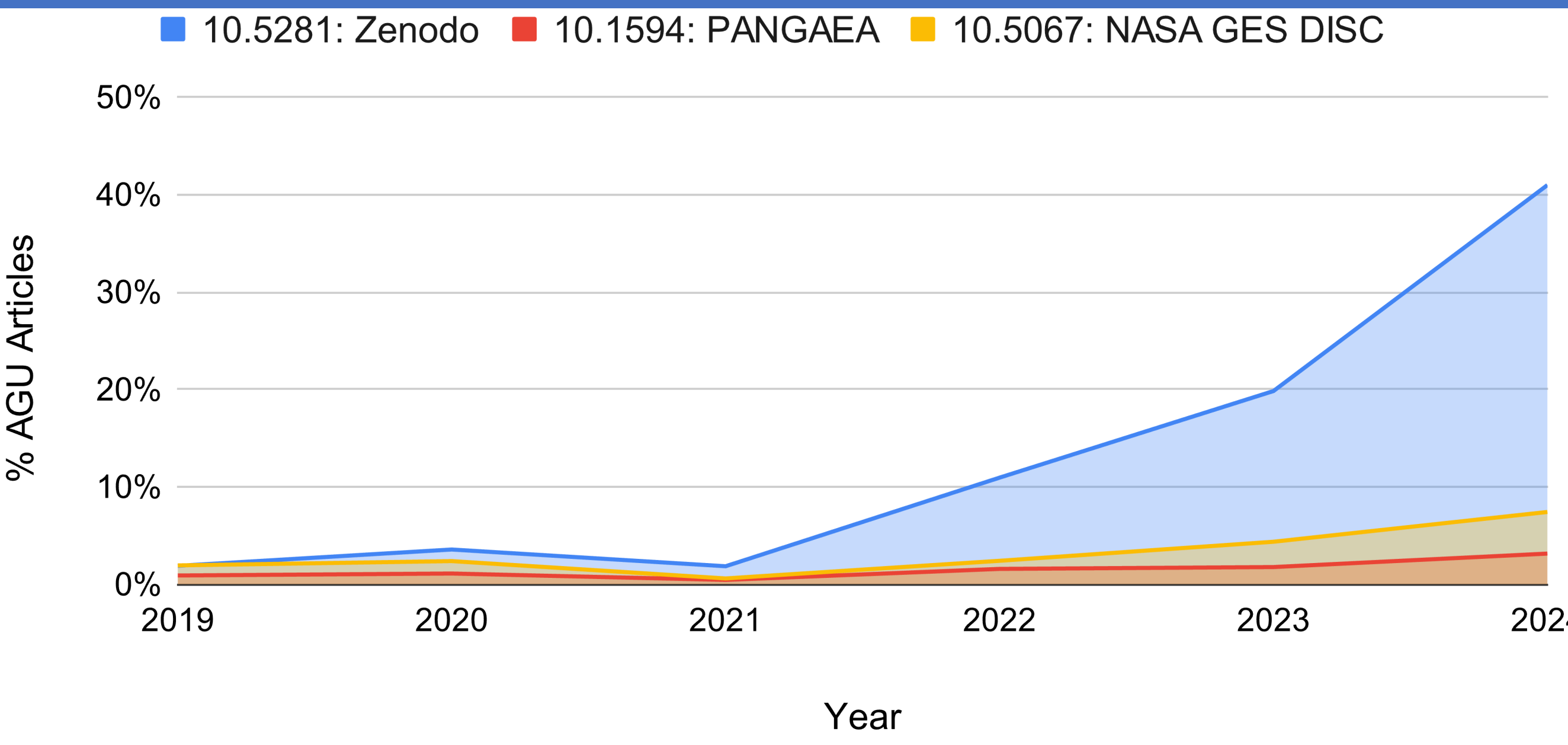


While staff effort is dedicated to enforcing *data* sharing, sharing of software has also increased over time. Here we show the % of AGU articles published 2019-2024 containing a reference tagged with [software] or [dataset]. Because usage and conventions vary across AGU's disciplines, in our guidance we refer to software and/or code. While usage of data repositories is highly heterogeneous, most software is shared via GitHub and/or Zenodo.

Unlike for scholarly articles, connections between publications, data, and software are not well-established, and examining linkages and metrics like citation counting remains difficult – a challenge for adoption. Here, we examine the effectiveness of counting dataset, software, and publication links using persistent identifiers through article reference lists, which are passed to Crossref, for our largest journal, *Geophysical Research Letters*.



We use both tagged citations (e.g., [dataset] or [software]), and a search for references containing the DOI prefix of 14 commonly-used repositories, to demonstrate the number of GRL articles that can be linked to cited datasets. A comparison to an example commercial database reveals a large gap to our citation and DOI-based analysis, highlighting the usefulness of DOI-based tracking and the need for standardized and open tracking and metrics.



As data citation has grown in our journals, so has the use of Zenodo (and other generalist repositories). How can we encourage FAIR data as well as open data?

What's Next?

We look forward to community conversations around implementing PIDs for tracking physical samples, instruments, funders, and more – and how publishers can best support these. Metadata and AI, and big data, continue to be topics of interest to our editors and authors.

agu.org/publish

kvrouwenvelder@agu.org; datahelp@agu.org

Schedule of AGU Learning Workshops at AGU24

Check out our guide to publishing with AGU

See all our AGU Publications sessions at AGU24

Workshops, presentations (inc. this one!), & more in our Zenodo community

