

Open Access Collection Development Strategies, FY 2024-28

University of Colorado Boulder University Libraries
Presented by the Open Access Guild July 2023

Melissa H. Cantrell, Co-Chair
Gabrielle Wiersma, Co-Chair
Elizabeth Novosel, At-Large Member
Chris Pusateri, Collection Management Team Member
Aditya Ranganath, CRDDS Member
Phil White, At-Large Member

I. Purpose and Scope

In 2022, the Deans of the University Libraries requested the Open Access Guild to produce an account of current Libraries spending on Open Access (OA) resources and publishing, and to provide recommendations for the continuation and enhancement of that support. The OA Guild focuses on scholarly communication work requiring collaboration and cooperation on open access initiatives from across the Libraries. Since CU Scholar, the digital repository for the University of Colorado Boulder, is managed by the Center for Research Data and Digital Scholarship (CRDDS) and is outside the scope of the Guild,¹ this report does not include recommendations related to CU Scholar, Green OA infrastructure², or other open infrastructural efforts, which are being addressed separately by various groups in the Libraries. Instead, this report outlines strategies to move CU Boulder researchers collectively towards an open access future by increasing and accelerating the adoption of open access publishing in both Gold and Hybrid OA routes as part of our overall collection development strategy.³

II. Executive Summary

In Fall of 2022, the OA Guild evaluated the Libraries' current commitment to OA funding and the status of OA publishing by CU Boulder researchers. The OA Guild used a variety of data sources and documentation including [Dimensions](#), [Elements](#) (CUBE), OA Fund and CU Scholar data, as well as [State of Open](#) reports from the Libraries to inventory publishing outputs and assess open access patterns by publication venue and type. The purpose of the inventory was to determine what needs were currently being met and to identify major gaps where researchers could be better supported through Libraries OA funding or support. The full inventory and assessment can be found in the [Appendix](#). Below is a list of key findings from that process.

¹ [Proposal: Open Access Guild](#)

² Andrew Johnson, the Lead for Data and Scholarly Communication Services, requested that recommendations related to CU Scholar and Green OA infrastructure be delayed until his return from sabbatical

³ See [Appendix](#) for full explanation of OA routes and meanings.

Key Findings from Inventory & Assessment:

1. CU Boulder researchers are actively publishing OA articles and conference proceedings.

Fifty-eight percent (58%) of articles and proceedings published between 2015 to 2021 are Open Access by some route, with Green and Gold being roughly equally prominent routes to open access publication. (See [Appendix, Figure 1](#)).

2. OA publications have increased significantly from 2015 to 2021, suggesting growing motivation to make research outputs openly accessible, with or without funding.

From 2015 to 2021, the share of unfunded Gold or Hybrid open access articles and proceedings grew from 8% to 22% of total unfunded articles and proceedings. For funded research, the share of those that are Gold or Hybrid OA grew from 26% to 34%.

3. Articles resulting from research funding were significantly more likely to be published open access through any route.

From 2015 to 2021, just over a third (34%) of articles and proceedings without funding were published or made OA by any route, while over the same time period more than two-thirds (70%) of articles and proceedings with funding were published or made OA by any route. Research funding is associated with an additional 10% and 9% of outputs being made openly available on a Gold OA and Hybrid OA basis, respectively (See [Appendix, Figures 3,4 and 5](#)).

4. Gold OA is not a prominent publishing route within many top publishers.

Other than a couple notable exceptions, very few articles and proceedings from faculty are published Gold OA in any of the top ten publishers for each college (See [Appendix, Figures 17-24](#)). In fact, in every college except the University Libraries, College of Music, and Environmental Design, the majority of Gold OA articles and proceedings from 2015 to 2021 were published *outside* of the top 10 publishers for each college. This suggests a latent need for more open access support for the publication venues in which researchers in each college are publishing the most.

5. Campus support for Open Access publishing for research outputs that are not articles or proceedings, in particular for chapters or monographs, is lacking.

Dimensions data indicates that between 2015 and 2021 CU Boulder researchers published 1,412 chapters or monographs. Of those, only 11% were made or published OA by any route, and only 2% via Gold or Hybrid OA. Nine percent (9%) of chapters and monographs were made openly available via Green OA⁴ (See [Appendix, Figure 2](#)).

⁴ There is a discrepancy between the CU Boulder Elements and Dimensions data sources for monographs shown from 2015-2021. Although CUBE shows more monographs published during the time period, the Guild decided to use the Dimensions data set in its analysis of monographs because it is the only data which displays the OA status of those works. However, it should be noted that the Dimensions count of monographs and chapters is likely an undercount based on its [indexing criteria](#).

6. Libraries OA funds are an insufficient source of funding for Open Access publishing demands on campus.

In 2020, the Libraries OA Fund was only capable of subventing 4.2% of the total costs of eligible Gold OA articles. Compared to the estimated \$1.3 million spent⁵ on APCs via Gold OA⁶ and \$2.2 million spent on APCs via both Gold and Hybrid routes in 2020, the Libraries spent only \$57,000 to support open access publications through the OA fund and less than \$150,000 to support OA overall. (See [Appendix, Figure 15](#)). Even our 2022 allocation of \$150,000 will only cover 11.1% of the projected OA costs that would be fully eligible for support (assuming they are level from 2020 numbers). This suggests there is unrealized potential for the Libraries to support and fund Gold Open Access across campus.

III. Goals, Strategies, and Recommendations

Goals = high level; what are we trying to do or change?

Strategies = General ways we could achieve our goals; we do this by...

Recommendations = Specific ideas, timeframes, measurable outcomes

1. Goal #1: Disseminating CU Boulder scholarship as widely as possible and making our many research outputs freely available to everyone, especially to the taxpayers who underwrite our academic enterprise.⁷

a. Strategies:

- i. Support researchers in meeting compliance requirements for new policies, such as the August 2022 OSTP Memorandum on Public Access to Federally Funded Research, by bolstering resources and infrastructure for data management, self-archiving, and open access publishing.
- ii. Partner with the Research & Innovation Office (RIO) and the Office of Contracts and Grants to increase awareness of and compliance with policies. Advocate for an increase in funding to the Libraries Departmental Administration Indirect Cost Recovery (DA-ICR) to support open access publishing⁸.
- iii. Redirect library funds (collections and operations) to support open access publishing and infrastructure. Dedicate a growing percentage of our budget to these efforts and commit to increasing support by 10-20% annually.
- iv. Consider ways to request one-time or ongoing funding through the campus budget model.

⁵ By CU authors/campus

⁶ A full explanation of the methodology is available in the [Special Report](#), but this cost was estimated by looking up article processing charge costs in the Directory of Open Access Journals (DOAJ) for each article published in a Gold OA journal in the 2020 Dimensions data set.

⁷ from UC's

<https://senate.universityofcalifornia.edu/files/committees/ucolasc/scholcommprinciples-20180425.pdf>

⁸ <https://www.colorado.edu/ocg/departamental-administration-indirect-cost-recovery-da-icr-program>; FY23 Libraries received \$7,149

1. We could use the data for APC payments by department ([see Tables 3-8](#)) to estimate a recommended amount for each College or unit to contribute annually to a shared funding pool (centrally managed by the Libraries) to support OA publishing costs. This could be similar to the new faculty library funds from A&S and could start with an amount equal to or slightly less than the amounts we estimate are already being paid by individual units across campus.
 - v. Since funding is limited, give special consideration to research that has not received funding, is comparatively under-funded, or which is less likely to receive support to publish OA, by evaluating publishers and terms of contracts to see if they provide support for this category of research.
 - vi. Negotiate license agreements that allow self-archiving of publications via Green OA and comply with the CU Boulder campus open access policy. Advocate for workflows that streamline deposits of post-prints into scholarly repositories.
 - b. Recommendations:
 - i. Scaling up funding to dedicate at least 5% of the Libraries overall budget each year to support open access publishing and infrastructure.
 - ii. Encourage funding recipients to include Open Access costs as part of their grant applications, because funded researchers' needs will primarily be met through infrastructural support and by providing education and outreach efforts.
- 2. Goal # 2: Prioritize deals with publishers with demonstrable commitment to sustainable open access practices.**
- a. Strategies:
 - i. Leverage [Libraries Licensing Priorities](#) and apply [Procedures and Priorities for Open Access Agreements, Memberships, Funds, and Initiatives](#) produced by the OA Guild. Reward “good actors” and innovative business models which seek true transformation of business models and sustainability.
 - ii. Pursue transformative agreements that reduce or eliminate the APC costs for CU Boulder authors. Prioritize partnerships with publishers with non-APC based models and other models that move away from “author pays” or “library pays on behalf of author” frameworks (including transformative agreements).
 - iii. Pursue agreements and initiatives which would reduce the overall volume of closed research over time (not just expand open access research while maintaining the prevalence and prominence of closed publications - See Appendix, Figures 9-10).
 - a. Recommendations

- i. Pursue APC-based initiatives and agreements (including transformative agreements) with equal aggressiveness and commitment as non-APC business models.⁹
 1. Pursue agreements with largest publishers which will give OA the broadest reach
 2. At the same time, reward sustainable practices and smaller publishers with a commitment to transition to OA.
 - ii. Assess Frontiers, PeerJ, and MDPI memberships for sustainability and cost-effectiveness, and if relevant, consider shifting funds to alternative models.
- 3. Goal # 3: Use data to identify top publishers by college¹⁰ and OA outputs within those publishers to pursue deals with both broad impact across colleges as well as deep impact within individual schools/colleges.**
 - a. Strategies:
 - i. Prioritize outreach to research areas, departments, and schools/colleges whose publications may not currently be represented by our open access agreements and memberships.
 - ii. Seek to improve support for OA publishing for all faculty equitably, with acknowledgement that there may be deterrents to publishing OA beyond a lack of financial support - e.g., OA publication outlets in the field are not prestigious enough, or have questionable practices, or there are simply stronger incentives towards a particular set of subscription journals.
 - b. Recommendations:
 - i. Pursue agreements with top publishers by college (see #2). Acknowledge that pursuing top publishers could reinforce existing disparities in OA funding and support.
 - ii. The OA Guild will collaborate with liaisons to conduct regular outreach to departments/faculty and assessment of current scope of OA initiatives and agreements to identify and close gaps.
 - iii. Conduct outreach or partner with faculty tenure committees to discuss incentives for and impact of open access scholarship.
- 4. Goal # 4: Increase the overall proportion of gold open access articles and conference proceedings published by CU Boulder authors.**
 - a. Strategies:
 - i. Increase the proportion of gold open access from 20% in 2022 to 30% by 2030, so that CU Boulder's overall percentage of OA articles and

⁹ [Redacted]

¹⁰ See [Figures 17-24 in Appendix](#)

- conference proceedings *per year* grows to approximately 65%, or nearly two-thirds of total outputs by 2030.¹¹
- ii. Establish sustainable funding support and robust infrastructure so that Open Access becomes CU Boulder's default or preferred publishing model and not an alternative or additional route to closed publishing, with additional costs.
 - iii. Employ parallel strategies to increase the overall OA outputs through gold, bronze, and green models, including advancing infrastructure for Green OA.
- b. Recommendations:
- i. Explore ways to decrease the volume of closed publications per year at the same time as increasing the volume of OA publications. As noted in the inventory, the number of closed publications has remained relatively steady resulting in the proportion of open access publications to be somewhat stagnant since 2020 (See Appendix, Figures 6 and 7). A lack of reduction in closed publications suggests that OA may represent an *additional* publication route rather than an *alternative* route.

5. Goal # 5: Expand OA support for other research outputs, such as monographs and book chapters.

- a. Strategies:
- i. Stay abreast of and consider initiatives in this area beyond the current commitment to Towards an Open Monograph Ecosystem (TOME).
 - ii. Explore community-led and scholar-led publishing initiatives and tools.
 - iii. Pursue opportunities to harness collective action to support open monographs like Knowledge Unlatched, MIT's Direct to Open, etc.
- b. Recommendations:
- i. Scale up TOME commitment over the course of the five-year strategic plan until the Libraries are funding TOME at \$120k per year, or approximately 8 monographs a year at the current estimate of \$15k per monograph.¹²
 - ii. Continue support for initiatives that advance faculty and researcher-led publishing initiatives, such as Open Journal Systems (OJS) and PressBooks, and develop strategies for expanding their adoption and use.
 - iii. Cap use of general OA Fund at \$100,000 for journal articles, and allow more applications for book chapters to utilize this fund.

¹¹ With current overall OA outputs hovering around 55%, based on 2022 Dimensions data, this represents a significant but achievable milestone. This percent increase also acknowledges that although OA shows overall growth trends, the proportion of OA to total outputs has been somewhat stagnant since 2020.

¹² The actual number of monographs ultimately funded per year may be less, as a report published in June 2022 indicates that the cost from institutions per monograph, originally estimated at \$15k, may be more: <https://doi.org/10.17613/pvek-7g97>.

IV. Budget Proposal

[Redacted]

V. Next Steps

The OA Guild requests that the Libraries Deans review this strategic plan and provide the Guild with feedback on the strategies, objectives, and recommendations for FY 24-28 by December 2023. Specifically, the Guild asks that the Deans:

- Specify approval of or indicate adjustments needed to the five major goals and their associated strategies and recommendations;
- Provide feedback on the components and feasibility of the budget proposal

If the Deans wish to make any recommendations to significantly change the targeted areas for growth in open access publishing support or the proportions at which support would increase annually for those areas, the Guild requests for these recommendations to be included in the feedback from the Deans.

Regardless of how much funding we are able to commit to open access publishing and infrastructure, the Guild encourages the Libraries and campus leadership to consider strategies to ensure our expenditures are congruent with our broader and longer-term OA objectives.

Upon receipt of feedback and budget details from the Libraries Deans, the Guild will:

- Provide yearly updates on how funds towards OA are being allocated;
- Yearly updates will include iterative assessment of existing OA collections commitments (OA Fund, Frontiers, etc.)
- Provide yearly presentations to the Libraries on the Guild's progress in achieving the goals outlined in this plan

At the end of the five-year period of the strategic plan, the OA Guild will produce a report on the successes and challenges of working towards these goals, as well as how these goals, strategies, and recommendations may need to be adjusted for future years.

VI. Conclusion

The Guild acknowledges that there are various approaches and models for achieving open access and the actionable strategies may need to change over time. Additionally, not all initiatives will simultaneously meet all of the goals and priorities above. For example, one deal may meet a significant gap in support to a particular college or discipline, but at the same time resemble a "Big Deal" in its business model. Under these circumstances, it is the imperative of

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the Guild to assess each new agreement holistically and to ensure that our open access collection development—taken as a whole—moves these strategic goals and priorities forward.

In collaboration with faculty and campus stakeholders, the University Libraries have great potential to be key contributors to the transformation of the system of scholarly communication from one that remains closed and unaffordable, to one that is more open, transparent, and sustainable. The Guild believes that these goals and strategies support the mission of CU to serve the public good and that acting upon them will accelerate our ongoing efforts to make the products of CU research and scholarship as freely and widely available as possible through open access.¹³

¹³ Based on the UCs statement on scholarly communication:
https://senate.universityofcalifornia.edu/_files/committees/ucolasc/scholcommprinciples-20180425.pdf

Appendix: Environmental Scan and Assessment

In Fall of 2022, the OA Guild evaluated the Libraries' current commitment to OA funding and the status of OA publishing by CU Boulder researchers. The OA Guild used a variety of data sources and documentation including [Dimensions](#), [Elements](#) (CUBE), OA Fund, and CU Scholar data, as well as [State of Open](#) reports from the Libraries to inventory publishing outputs and assess open access patterns by publication venue and type. The purpose of the inventory was to determine what needs were currently being met and to identify major gaps where researchers could be better supported through Libraries OA funding or support.

The Guild also conducted an environmental scan of other libraries or universities that have adopted or implemented strategic priorities for open access publishing and collection development. The findings based on our assessment of these data sources are detailed below.

Dimensions

Dimensions data was one of the most fruitful data sources for assessment¹⁴. Dimensions, part of the Digital Science portfolio provided through Faculty Affairs, is “an innovative grants and funder database, citation index, and research analysis tool that provides insights into research activities from multiple perspectives allowing CU Boulder stakeholders to analyze and understand the research landscape across the U.S. and around the globe.”¹⁵ Dimensions for CU Boulder combines faculty FRPA reporting data with the Unpaywall data source, which provides key insight into the type of open access for each publication. Table 1 delineates the key types of OA identified in the Dimensions data.

Table 1 - Types of Open Access

Type	Description
Green Open Access	This content is made OA when a version of a closed access or subscription article is posted to a repository (institutional, subject, etc.)
Gold Open Access	This content is made OA through a journal that exclusively publishes OA articles. An APC sometimes but not always applies.
Hybrid Open Access	This content is made OA through a journal that offers the author(s) a choice to publish an article OA or via the closed/subscription model. An APC always applies if the OA option is selected.
Bronze Open Access	This content is free to read on a publisher's website but lacks a clearly identifiable license, typically making the article unavailable for reuse.

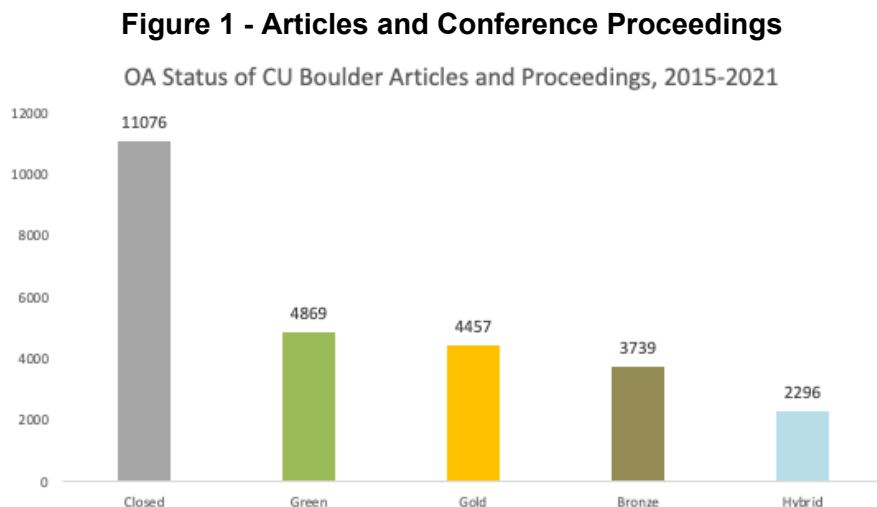
¹⁴ The Dimensions subscription is a joint effort of the Office of Faculty Affairs, the University Libraries, and the Research & Innovation Office (RIO). Digital Science portfolio includes ReadCube, Altmetric, Figshare, Symplectic, Digital Science Consultancy, ÜberResearch and Dimensions.

¹⁵ <https://www.colorado.edu/fis/dimensions>

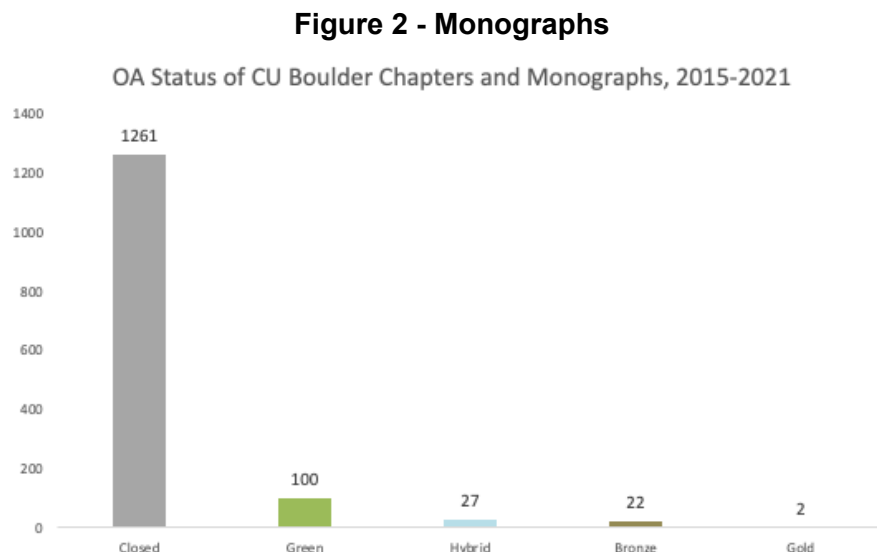
Articles, Conference, Proceedings, and Monographs

According to Dimensions, CU Boulder affiliated authors published **1,412 chapters or monographs, and 26,337 articles or conferences proceedings** from 2015-2021. Figures 1 and 2 describe the open access status of these publication types across the years analyzed.

Fifty-eight percent (58%) of articles and proceedings are open, with Green and Gold being the most prominent routes to open access (see Figure 1).



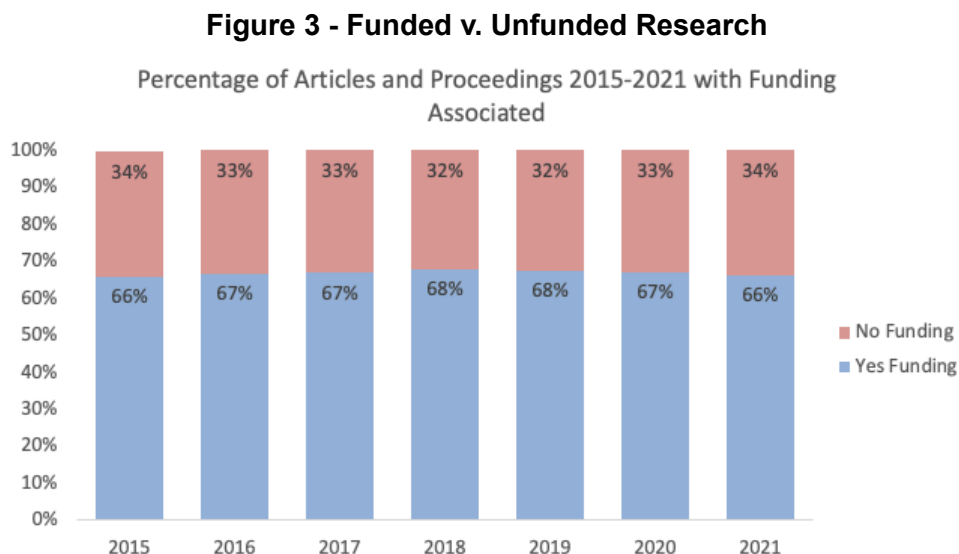
Almost 11% of chapters and monographs are OA in some form, primarily through Green OA, which is expected given the considerable cost of OA for chapters and monographs (see Figure 2).



Funded v. Unfunded Research

One of the most unique aspects of Dimensions data is its inclusion of grant funding categories for research publications affiliated with CU Boulder. The Guild primarily used Dimensions to analyze the relationship between grant funding and open access publishing from 2015-2021.

Of the total 26,337 articles and proceedings during this period, 17,648 had research funding associated with them.¹⁶ Figure 3 shows approximately two-thirds of CU Boulder articles and proceedings had funding associated with them.



Based on the available information, the Guild is unable to determine the amount of funding associated with each publication, the type of funding, and whether funding would be available for open access publication charges. However, public access is sometimes a requirement for research funding, in particular for U.S. federally funded research.¹⁷ Additionally, research with funding is more likely to have additional resources to pay for potential publication fees, whether or not that cost was written into grant documentation. Figure 4 and Figure 5 display the impact of funding on public availability of research articles and conference proceedings:

¹⁶ Due to the nature of the data and sheer volume of publications, it was not possible to (manually) analyze the amount and source of the research funding. Publications were simply coded with a Y(Yes) if a funding source was present or N(No) if funding was not present.

¹⁷ <https://pas.wisc.edu/other-federal-agency-public-access-requirements/>

Figure 4

OA Status of Articles and Proceedings WITHOUT Funding, 2015-2021

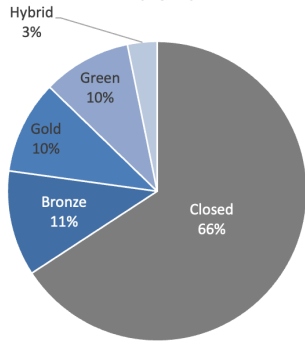
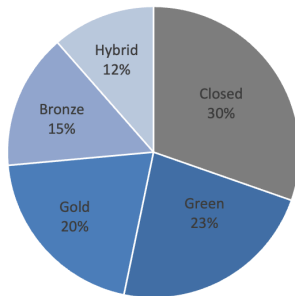


Figure 5

OA Status of Articles and Proceedings WITH Funding, 2015-2021



When comparing funded publications to those without funds, it is apparent that funded research enjoys a one-third greater likelihood of being made openly available. Notably, research funding is associated with an additional 13% of outputs being made openly available on a Green OA basis, and an additional 10% and 9% of outputs being made openly available on a Gold OA and Hybrid OA basis, respectively.

Further analysis reveals increased levels of OA publishing among both funded and unfunded research during the period in question (Figures 6 and 7).

Figure 6 - Unfunded Research

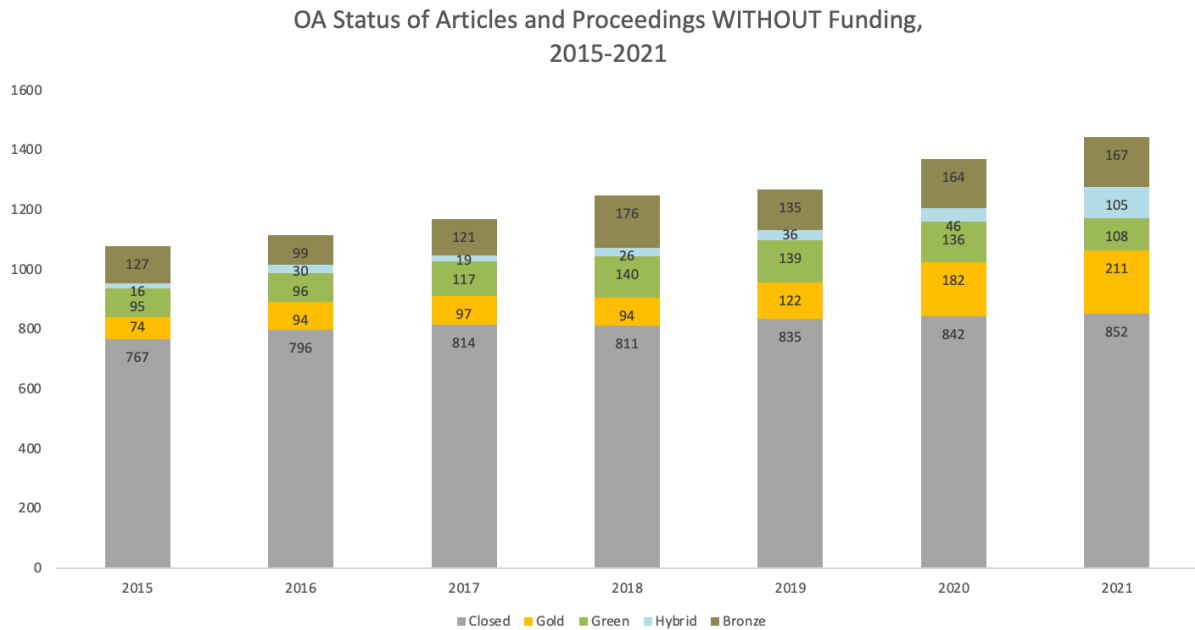
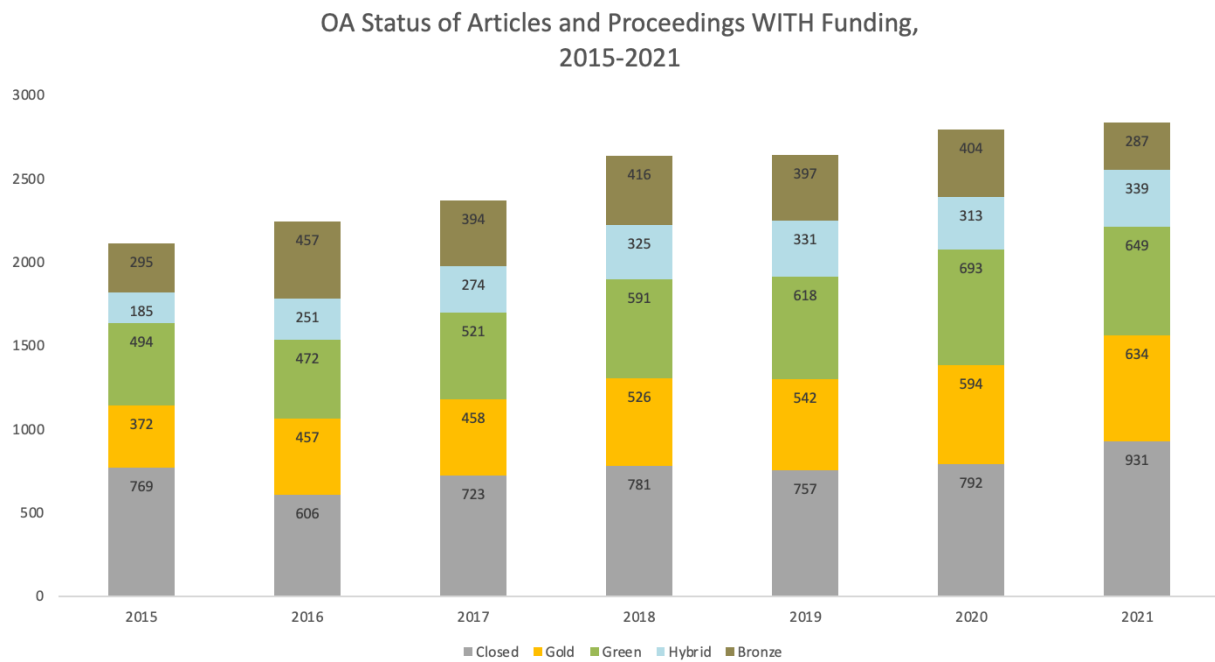


Figure 7 - Funded Research



For both categories of research, overall publication outputs have steadily increased over the seven-year period analyzed. However, the number of closed publications has remained

relatively steady, while the volume of open access publications has grown across all categories. This implies that with or without funding, the motivation to make publications openly accessible has grown over time. The OSTP Memo "Ensuring Free, Immediate, and Equitable Access to Federally Funded Research" underlines the need for an OA Strategy that supports both funded and unfunded research.

Publisher Trends

Furthermore, when examining open access patterns by publication, it is apparent that those patterns vary from one publisher to the next, and also differ depending on whether or not funding was available for the research output (Figure 8 and Figure 9). In general, Gold OA is not the primary route to open access for many top publishers.

Figure 8 - Ranking of Unfunded Articles

OA Status of Articles and Proceedings WITHOUT Funding in Top 10 Publishers, 2015-2021

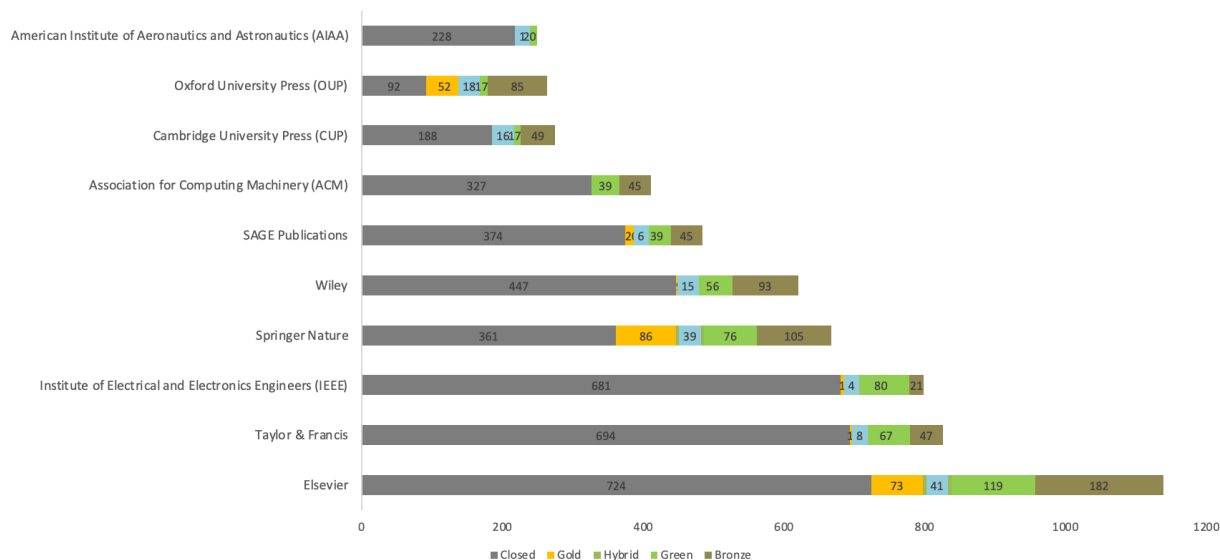
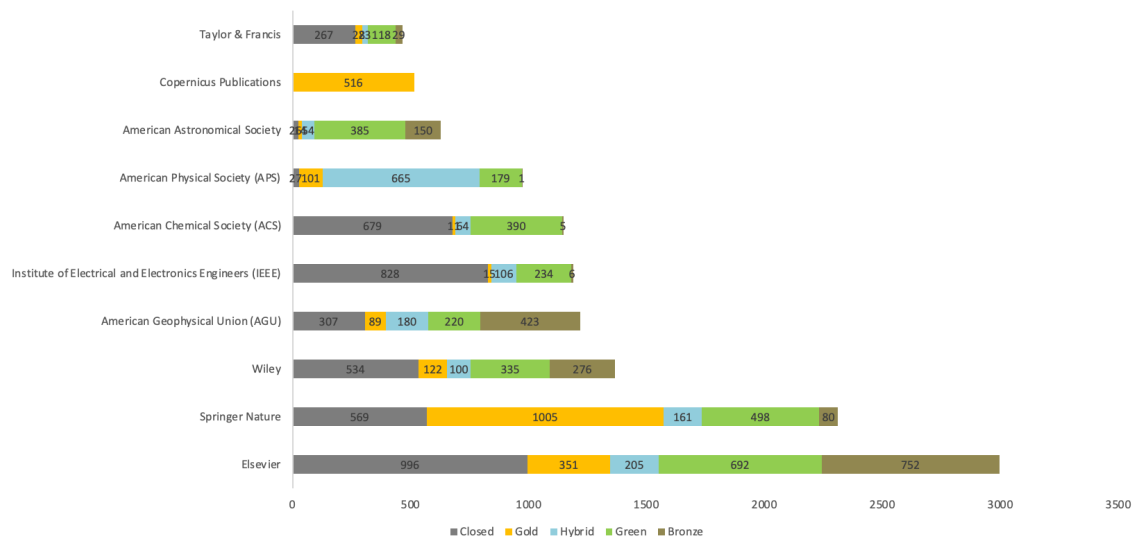


Figure 9 - Ranking of Funded Articles

OA Status of Articles and Proceedings WITH Funding in Top 10 Publishers, 2015-2021



As an example of variance between publishers, consider within the sample of articles with funding the volume of Hybrid OA publications in the American Physical Society (APS) compared to hybrid publications in any of the other top 10 publishers from 2015-2021. Based on the volume of hybrid publications in APS relative to other OA types, we can see the comparative prominence of that OA publication route. As an example of variance between publications with and without funding, consider Springer-Nature. For publications without funding, Bronze OA is the most common form of open access and Gold and Green OA are similarly distributed. However, for Springer-Nature publications with research funding, Gold OA is by far the preferred route (more than double Green OA), while the incidence of Bronze OA is negligible.

These findings are significant to collection development considerations because some OA routes are more heavily favored by certain publishers, and OA routes might also be influenced by an author’s funding status. For this reason, the Libraries’ preference for one route over another must also consider what publishers/authors might be excluded on the basis of that decision.

The strategies of different publishers become more apparent when viewed over time (Figure 10 and Figure 11, as examples).

Figure 10 - Springer Nature

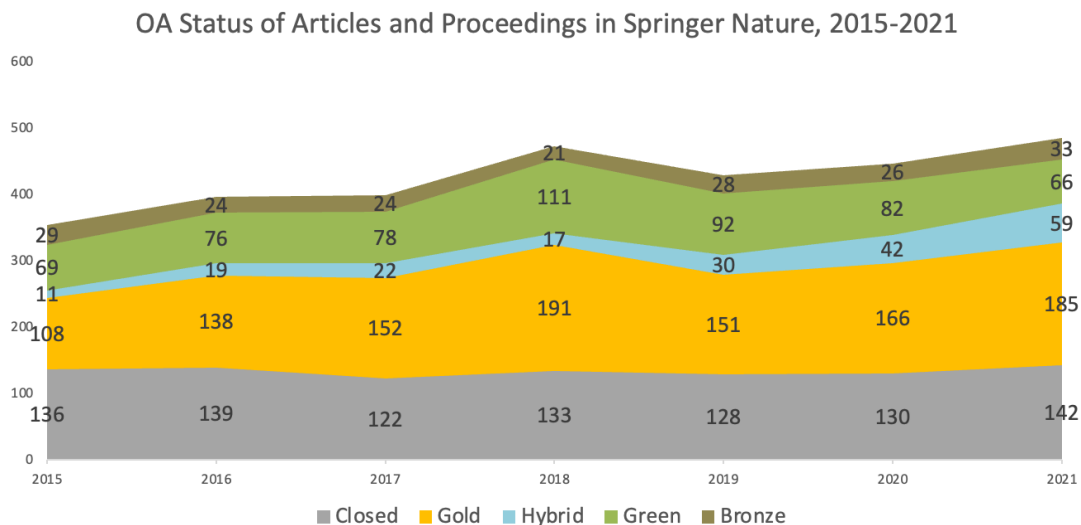
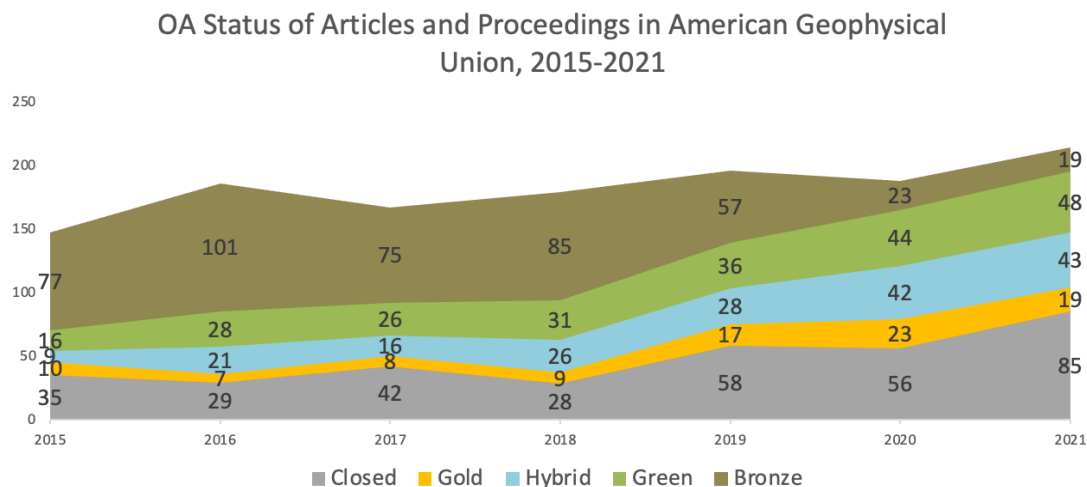


Figure 11 - American Geophysical Union



There are three trends in the examples above which hold true for the larger dataset which analyzes the top ten publishers across time.¹⁸ First, authors' choice of route to open access varies quite a bit across publishers. In the above examples, we see that Springer-Nature prioritizes Gold OA overall, while the American Geophysical Union has a mixed approach with overall growth in all forms of OA over time.¹⁹ Second, all publishers in our sample increased their total publication outputs over time, demonstrating overall growth in research literature. Further to this point, the overall growth of the literature shows a general trend towards publishing more research open access; however, the growth in OA literature is not necessarily accompanied by a decrease in closed literature. In fact, for many publishers, the volume of

¹⁸ The full dataset will be made available separately

¹⁹ It is to be expected that Bronze OA from more recent years is less than Bronze OA from older publications. Rather than indicating a move away from Bronze OA, it is simply the case that for many publishers it is common practice for publications to be made available via Bronze OA after a certain amount of time has elapsed.

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closed research has remained steady or has even grown over time. We see this in both the Springer-Nature and AGU examples above. This trend demonstrates that while publishers may be growing their portfolio of OA publications, they are not necessarily moving away from closed-access, subscription-based publication models in conjunction with this growth, but rather treating open access as an additional revenue stream to exploit in tandem with subscriptions. Third, these analyses illustrate disciplinary disparities in funding. Leading social science and humanities publishers like Oxford UP, Cambridge UP, Sage, and Taylor & Francis are prominently featured on the graph without funding, but notably absent from the graph for funded research.

State of Open Data

The Guild also analyzed data from CU Scholar and Open Access Fund, all of which is annually compiled in a State of Open report for CU Boulder.²⁰ An analysis of CU Scholar data from 2012-2021 is consistent with patterns in the Dimensions data, and shows how open access publishing has grown over time.²¹ Figure 12 demonstrates this general growth, with a more recent leveling off of this trend, and Figure 13 shows the breakdown of open access types from year to year:

Figure 12 - Publishing Modalities over Time

²⁰ <https://scholar.colorado.edu/concern/reports/rr171z786>

²¹ <https://scholar.colorado.edu/concern/datasets/k930bz33k>

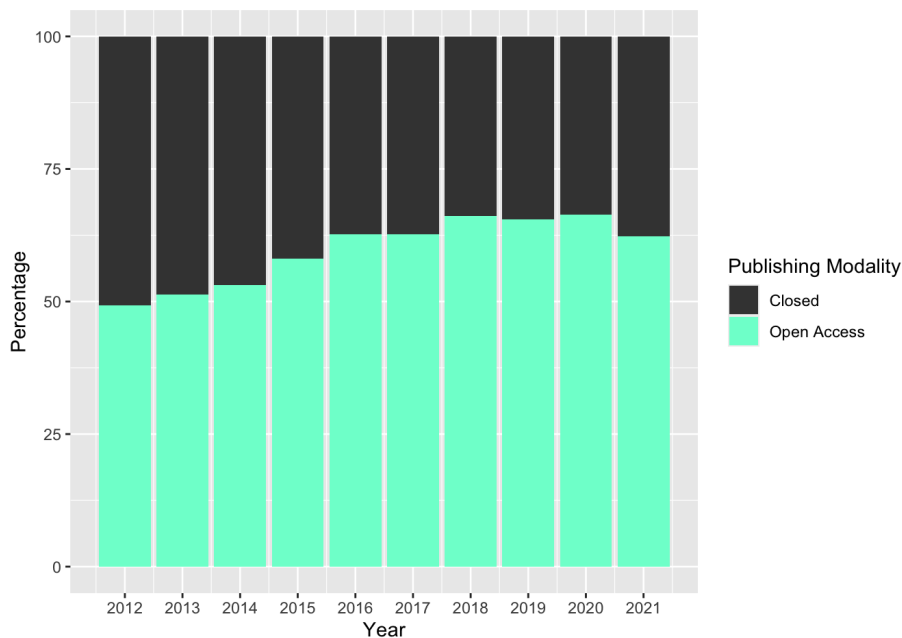
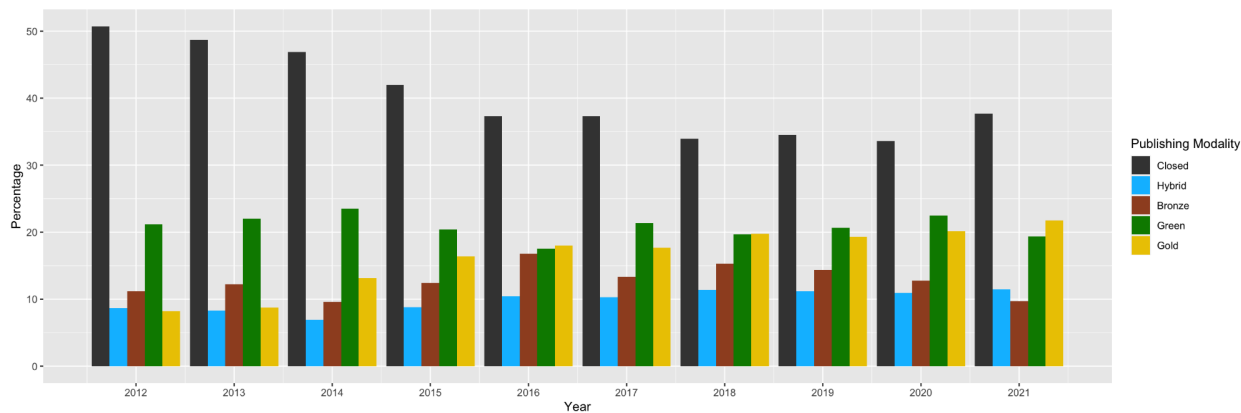


Figure 13 - Publishing Modalities in Detail

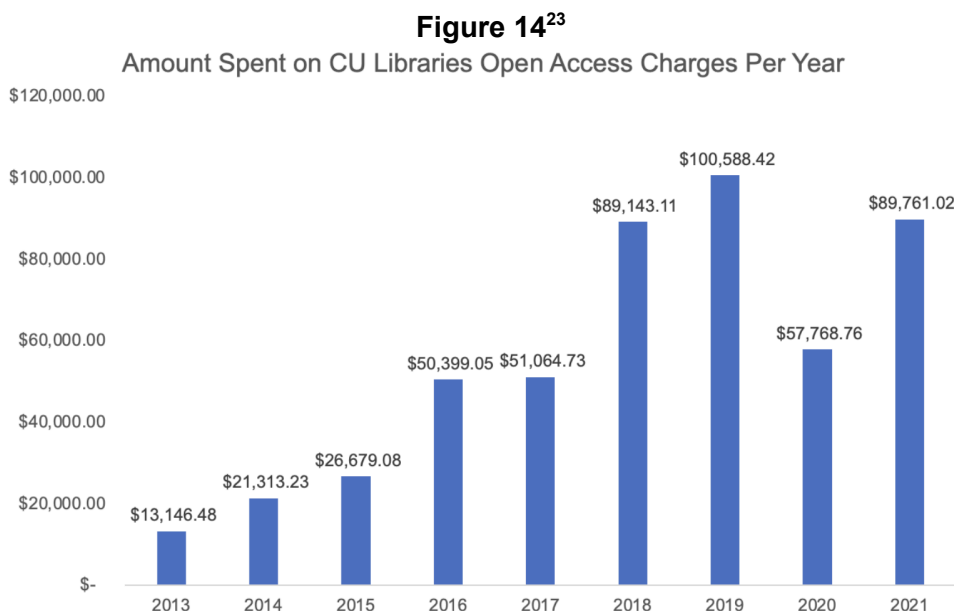


Since 2018, the proportion of open access by CU Boulder researchers has hovered at around two-thirds. In Figure 12, we can see that uptake of Gold OA has generally continued to increase over the years analyzed. The uptake of Hybrid OA increased somewhat over the first several years but has remained relatively steady since 2018. The uptake of Green OA has been more variable across time, peaking in 2014 and again in 2020, but has nonetheless remained the most popular route for open access across the years analyzed with the exception of 2016, 2018, and 2021, when it was second only to Gold OA.

OA Fund and APCs

The CU Boulder Libraries has historically supported Gold OA and the payment of article processing charges (APCs) related to Gold OA through the Open Access Fund and memberships with fully OA publishers, including Frontiers and PeerJ. In 2021 the Data and Scholarly Communication Services Section of CRDDS released a Special Report on

APCs that analyzed the extent of this support for Gold OA as compared to the estimated APCs being spent by CU Boulder authors.²² First, with the exception of 2020, when there was a downturn in open access spending due to budget uncertainties, the Open Access Fund has grown steadily but topped out at \$100,000 in 2019 and has otherwise hovered around \$90,000 annually (Figure 14).



With the addition of Frontiers and PeerJ, direct support for APCs in FY 2022 was just under \$150,000. However, the estimated total APCs spent by CU Boulder authors that would be eligible for OA funding through the Libraries totaled in 2020 more than \$1.3 million²⁴. That year, the OA Fund represented only 4.2% of the total eligible cost of Gold OA, and even CU Boulder Libraries estimated spending of \$150,000 in 2022 represents only 11.1% of the total eligible fully OA costs (assuming they are level from 2020 numbers). See Figure 14 for a direct comparison of Libraries’ costs in 2020 to total APCs eligible for funding and total APC spending, including ineligible Hybrid OA costs.²⁵

Figure 15 - Estimated Total APCs

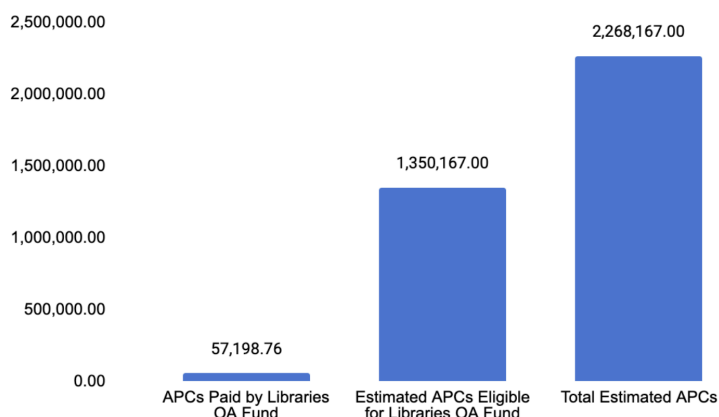
²² <https://scholar.colorado.edu/concern/reports/zc77sr262>

²³ This figure is derived from the [Reports | 2022 State of Open at the University of Colorado Boulder: An Update on Open Access Practices Based on Data from 2021](#)

²⁴ A full explanation of the methodology is available in the [Special Report](#), but this cost was estimated by looking up article processing charge costs in the Directory of Open Access Journals (DOAJ) for each article published in a Gold OA journal in the 2020 Dimensions data set.

²⁵ Hybrid OA has always been ineligible for CU Boulder Libraries funding due to “double-dipping,” a phenomena whereby journals receive OA funding from authors as well as subscription fees from libraries for the same publication.

2020 Total APC Estimates and Actual Libraries OA Fund Payments (\$)



This data points to expansive unmet needs for fully Gold OA publications that charge APCs, which cannot sustainably be met through existing open access funding and memberships.

APC Estimates from Unsub

Unsub uses publicly available APC prices to estimate APC spending at the journal level. These sums include APCs paid to gold and hybrid OA journals. They do not have access to corresponding author information, so they use fractional authorship and assume that any author on a given paper has an equal likelihood of being the corresponding author²⁶. The total cost for the institution is “calculated by multiplying the total fractional authorship by the APC price”.

The three-year (2019-2021) average expenditure on Gold APCs for Elsevier, Sage, Springer Nature, Taylor & Francis, and Wiley at CU Boulder was \$676,480 (Figure 15). For hybrid APCs it was \$620,610 (Figure 16). The total estimated average APC costs for these five publishers alone is approximately \$1,297,090. This is a significant expense for the university in addition to the approximately \$5.3M subscription costs paid by the Libraries for these same publishers.

Recent literature has pointed out the overall unsustainable nature and hyperinflation of APCs, which is coupled with the price insensitivity of authors willing to pay whatever it takes for publication in a prestigious journal.²⁷ These trends evince a need to shift and expand funding for transformative agreements that reduce overall APC costs while at the same time exploring and rewarding business models that eschew unsustainable APC practices.

²⁶ <https://docs.unsub.org/how-to-guides/apc-report>

²⁷ <https://libquarterly.eu/article/view/10729/11606#toc>

Figure 15- Gold APCs 2014-2022

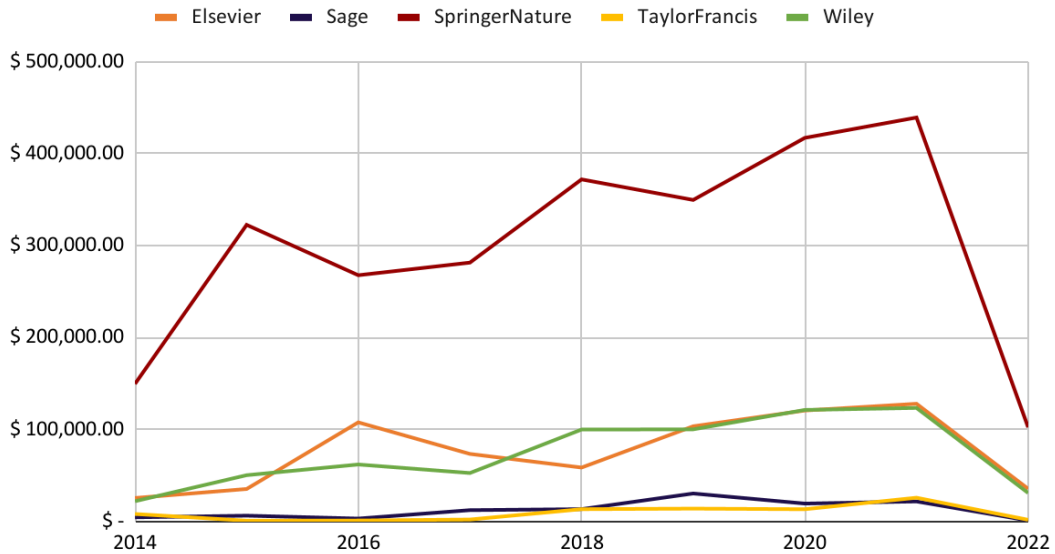
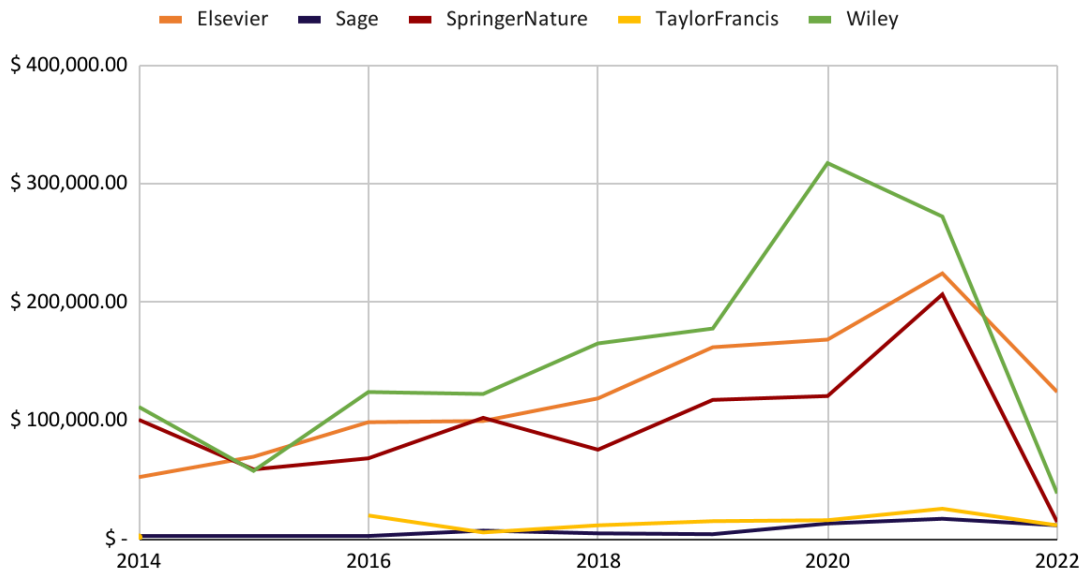


Figure 16 - Hybrid APCs 2014-2022



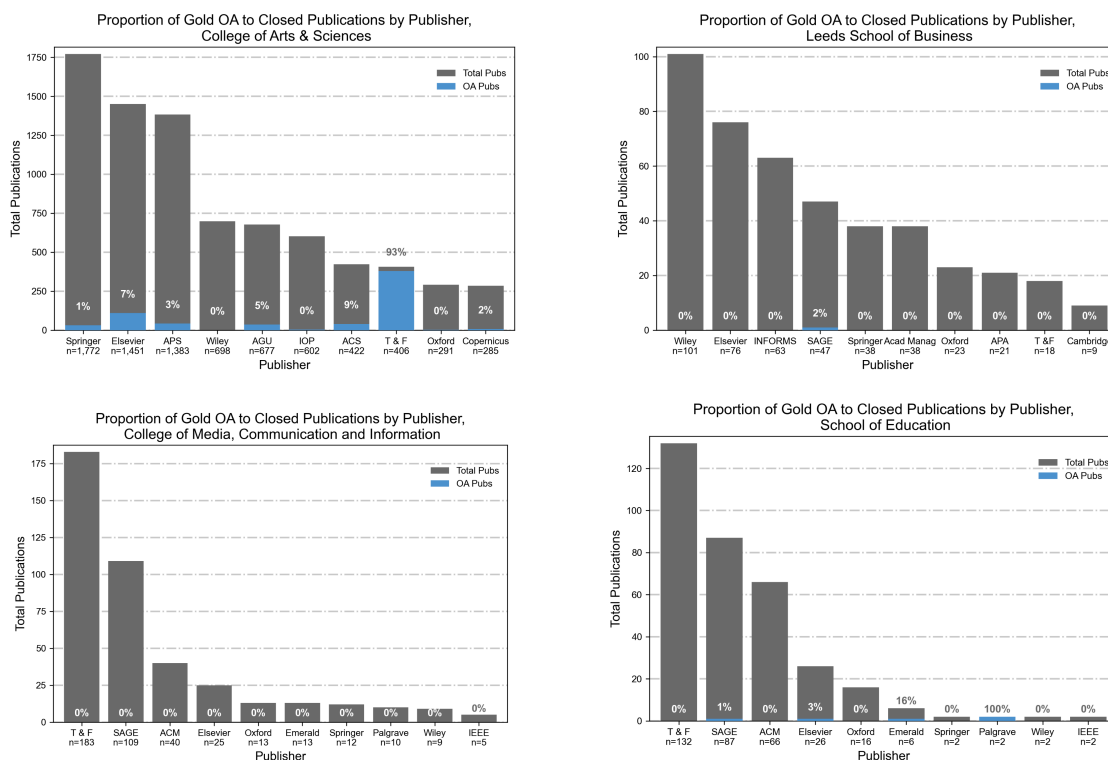
[CU Boulder Elements \(CUBE\)](#)

The most comprehensive source of faculty publication outputs is the CU Boulder Elements (CUBE) data provided through Faculty Affairs, which is “a critical data hub for faculty to interact with scholarly data for campus reporting requirements such as the annual Faculty Report of

Professional Activities (FRPA) for individuals as well as larger annual reporting for grants and other requirements while also collecting important campus-wide information to describe the contributions and scholarly impact of the Boulder campus faculty.”²⁸ While challenging to analyze due to the nature of self-reported data and limited OA descriptors (e.g., “Indexed in the DOAJ” which indicates only articles and proceedings published Gold OA), CUBE is the only dataset available to analyze publications at the departmental level.

In order to analyze open access trends by college or school, we downloaded article data for the years 2015 through Oct 2022 from Elements. We created Python scripts to group the publications by department and college and, for each year, calculated the percentage of Gold OA articles for each group by summing occurrences of articles indexed by DOAJ and dividing that figure by the group's total number of articles. After standardizing the publisher names, we determined the top 10 publishers for each college and calculated the proportion of Gold OA articles for the top 10 publishers for each college²⁹. The results, by college, follow.

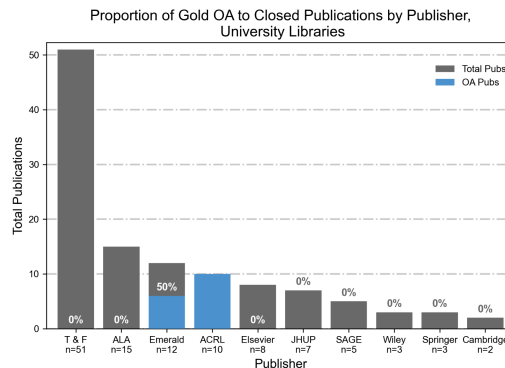
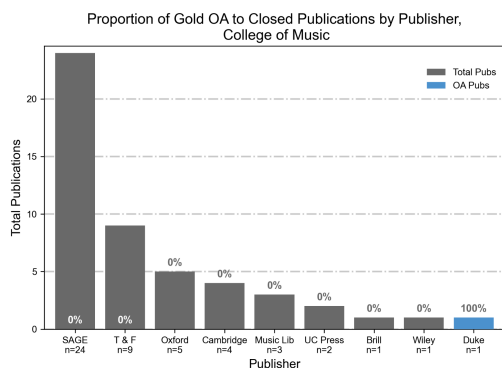
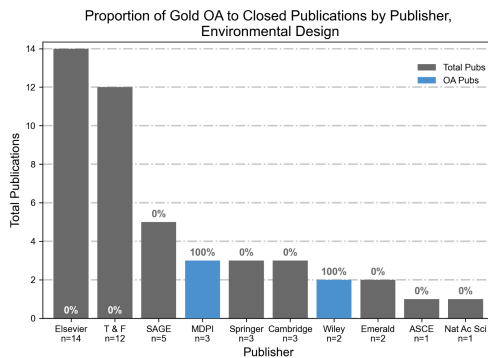
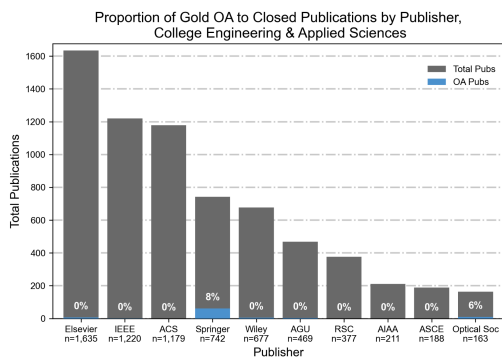
Figures 17 - 24 Publications by Department and College



²⁸ <https://www.colorado.edu/fis/CUBE>

²⁹ Law is not included since they have their own library covering their collection development needs.

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Other than a few exceptions, Gold OA publishing is not a significant route for faculty publishing in any of the top 10 publishers within their respective colleges.³⁰ It is important to note that Green, Hybrid, and other routes for OA may be significant with these publishers, but we are unable to discern those routes from the Elements data³¹.

Table 2 shows the total percentage of Gold OA across the years analyzed by college. Since the rate of total OA (Gold, Green, Hybrid, or Bronze) for the university hovers around 60%³², there is clearly a lot of room across all colleges for increasing uptake and funding support for Gold OA.

Table 2 - Percentage of Gold OA Articles and Proceedings by Department

College	% Gold OA All Years (2015-2022)
University Libraries	22%
Environmental Design	18%
Arts and Sciences	12%

³⁰ Most notably, perhaps, the 406 Gold OA publications through Taylor and Francis from A&S. All other top 10 publishers by college with a significant percentage of OA have a low “n” count.

³¹ Also, as mentioned previously, Green OA will be covered under separate recommendations and guidelines.

³² <https://scholar.colorado.edu/concern/reports/rr171z786>

College	% Gold OA All Years (2015-2022)
University Libraries	22%
CMCI	7%
College of Engineering and Applied Science	7%
College of Music	7%
School of Education	5%
Leeds School of Business	3%

Peer and Aspirational Institutions

In addition to existing CU reporting and data sources, we also surveyed documentation at peer or aspirational institutions in the U.S. and Canada as part of our environmental scan. This scan was therefore not exhaustive, but rather based on investigating websites and in some cases, by direct communication with individuals involved in OA work at other institutions. While we were unable to find any documentation from other universities that directly aligned with the format, purpose, and scope of our proposed strategic plan, we identified three document types to inform our approach:

1. External/Educational Strategy Documents

The University of California is notable for the extent of their documentation on OA strategies. As a [leader in OA policies](#), their website offers a variety of documents pertaining to its goal of shifting scholarly publishing towards Open Access. Their [Pathways to Open Access](#) outlines the many approaches they are weaving together in the goal to increase access to OA, including how they will support Green and Gold OA, build collaborative partnerships, and secure funding for APCs, as well as providing support for publications directly. Other notable UC documents include the [UC Open Access Policies](#), the [UC Publisher Relationships](#) document, and their [Guidelines for Evaluating Transformative Agreements](#) document. The University of California system declares that they intend to shift from using budgets to pay for journal subscriptions to paying for open access publishing over time, while their Pathways to OA evince a sweeping, multi-pronged approach to that overarching strategy. However, their documentation does not currently include more specific strategies about how they select approaches at certain times or prioritize publishers or business models in a way that advances their libraries and university's mission.

2. Task Force/Working Group recommendations on Transformative Agreements

The documentation that most clearly aligns with the goals of this report are those from several institutions that employed a task force or working group to generate a series of recommendations to guide its Libraries' participation in TAs. A couple of particularly robust examples are from the Massachusetts Institute of Technology (MIT) and the University of Waterloo.

MIT is heavily invested in sharing knowledge with the world through [open classes](#) as well as open scholarship. In 2019, their OA Task Force issued a [final version of their recommendations](#) on how the university and Library should proceed with supporting OA. It includes a statement of principles and a series of recommendations for policies, infrastructure and resources, as well as strategies for promoting advocacy and awareness. In this sense, MIT's task force recommendations on OA are more expansive in scope than this document, but also lack considerable depth into each recommendation and do not give significant consideration to transformative agreements and other collection development strategies.³³

Similarly, the University of Waterloo's Ad Hoc Collections Strategy Committee Working Group on Transformative Agreements created their [Transformative Agreements Report](#) which extensively outlines the benefits, issues, and challenges of TAs and offers alternative models to support OA and recommendations for future actions. The report emphasizes TAs as temporary arrangements meant to transition publishing to open access models. It also emphasizes that, before moving forward with OA collection development strategies, libraries should "identify, detail, and prioritize their goals within their overarching open access strategy. Often these goals can range from eliminating APC payments from their authors' workflows, to tracking APC spend by authors, ensuring more or all the articles published by their authors are OA, maximizing return on investment, maximizing campus readership, supporting the OA movement on a larger scale, and/or controlling or reducing subscription costs."

3. Transformative Agreement Rationale/Criteria

A number of scholarly communication librarians at peer institutions shared their library's policies regarding transformative agreements and OA via email. No librarian reported that their institution had a strategic plan; however, they had internal policies and concerns about TAs and OA publishing. They reported similar concerns, which are summarized in this list:

- OA content needs to fit collection development guidelines
- There must be transparency and sustainability in funding
- There cannot be capped annual publishing limits
- Scholarship must be available in accessible format
- Policies must uphold DEI values of institution
- Scholars must be able to contribute their work to their institutional repositories

³³ MIT's recommendations give considerable focus to Green OA (policy) initiatives and infrastructure for open data sharing

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- Libraries must not have to act as a gatekeeper, deciding what articles will be published and which will not/all authors from institution can participate
- Libraries must vigilantly observe trends and actions regarding OA/TAs in peer institutions
- A publisher’s intent must align with truly extending OA rather than profit/revenues to qualify for TAs
- Does the TA make financial sense, and are there better options with regards to cost
- How will authors know about their rights? How will they identify themselves as being able to participate in the TA?
- How will publishers perform “accounting” to institutions regarding the number of participants?
- How much use does the journal/publisher receive on campus?

CU Boulder Libraries has a similar document titled the “GWLA Read and Publish (Offset) Agreement Rationale and Criteria,” which was adopted in January 2019 from the GWLA Offsetting Task Force, and which outlines similar criteria for evaluating read and publish agreements (also known as transformative agreements). Based on these findings, the Guild has created our own procedures and priorities document:

☰ OA Agreements: Procedures and Priorities

OA Fund Subvention Awards by Year

Table 3: FY19

FY19	43
Ecology & Evolutionary Biology	10
Geography	4
Environmental Studies Program	3
MCDB	3
CIRES	3
Mechanical Engineering	2
INSTAAR	2
Physics	2
Materials Science and Engineering Program	1

Center for STEM Learning	1
Geological Sciences	1
Institute of Behavioral Sciences	1
Applied Math	1
Anthropology	1
CIRES/ Atmospheric and Oceanic Sciences	1
Environmental Engineering	1
Chemical and Biological Engineering	1
Electrical, Computer and Energy Engineering	1
CEAE	1
Integrative Physiology	1
INSTAAR/Geological Sciences	1
Environmental Studies	1

Table 4: FY20

FY20	63
Physics	9
EBIO	6
CEAE	6
Mechanical Engineering	5
Geography	4
MCDB	4
Environmental Studies	3
INSTAAR	3
Applied Math	2

Materials Science and Engineering Program	2
Integrative Physiology	2
Psychology and Neuroscience	2
ECEE	1
Mathematics	1
Computer Science	1
Wardenberg Medical Services	1
Institute of Behavioral Sciences	1
IBS and Geography	1
Program in Environmental Design	1
IBS	1
CIRES	1
Journalism	1
Atmospheric and Oceanic Sciences	1
Psychology & Neuroscience	1
Anthropology	1
Electrical, Computer and Energy Engineering	1
IBS/Geography	1

Table 5: FY21

FY21	46
EBIO	5

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MCDB	5
CIRES	4
CEAE	3
INSTAAR	3
Museum of Natural History and Geological Sciences	2
School of Education	2
Physics	2
Environmental Studies	2
Journalism	2
Geography	1
Mechanical Engineering	1
Sociology	1
Astrophysical & Planetary Sciences	2
Aerospace Engineering	1
Political Science	1
Institute of Behavioral Sciences	1
SLHS	1
INSTAAR/EBIO	1
Atmospheric and Oceanic Sciences	1
Psychology and Neuroscience	1
STEM Center and Physics	1
Geological Sciences	1
Technology, Cybersecurity, and Policy	1
Integrative Physiology	1

Table 6: FY22

FY22	45
EBIO	10
CIRES	3
Geography	3
Physics	3
Mechanical Engineering	3
Civil, Environmental, and Architectural Engineering	2
Psychology and Neuroscience	2
ECEE	2
MCDB	2
Information Science	2
Libraries	1
Biochemistry	1
Institute of Cognitive Science	1
Aerospace Engineering	1
Materials Science and Engineering Program	1
Psychology & Neuroscience	1
CIRES/ Environmental Studies	1
ENVS	1
CEAE	1
APRD	1
SOCY	1
Theatre and Dance	1

Geological Sciences	1
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Table 7: FY23

FY23	46
Mechanical Engineering	4
ECEE	3
CEAE	3
EBIO	3
MCDB	3
CIRES	3
Museum of Natural History	2
Physics	2
Computer Science	2
Geography	2
Environmental Studies	2
SLHS	2
Geological Sciences	2
INSTAAR	2
Psychology and Neuroscience	1
Atmospheric and Oceanic Sciences	1
Political Science	1
IPHY	1
College of Music	1
Integrative Physiology	1
Chemical and Biological Engineering	1

Institute for Behavioral Genetics	1
JILA	1
CU Population Center	1
Information Science	1

Table 8: Cumulative OA Fund Subvention Awards, FY19-23

Department	Total
EBIO	34
Physics	18
MCDB	17
CEAE	16
CIRES	16
Geography	16
Mechanical Engineering	15
INSTAAR	12
ENVS	12
ECEE	8
Psychology & Neuroscience	8
IPHY	6
Geological Sciences	5
Materials Science and Engineering Program	4
Museum of Natural History	4
IBS	4
Applied Math	3
Atmospheric and Oceanic Sciences	3

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Computer Science	3
Information Science	3
Journalism	3
SLHS	3
Aerospace Engineering	2
Anthropology	2
Chemical and Biological Engineering	2
Political Science	2
Astrophysical and Planetary Sciences	2
School of Education	2
Sociology	2
APRD	1
Biochemistry	1
Center for STEM Learning	1
College of Music	1
CU Population Center	1
Environmental Engineering	1
Institute for Behavioral Genetics	1
Institute of Cognitive Science	1
JILA	1
Libraries	1
Mathematics	1
Program in Environmental Design	1
STEM Center and Physics	1

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Technology, Cybersecurity, and Policy	1
Theatre and Dance	1
Wardenberg Medical Services	1

Table 9: Cumulative Costs of OA Fund Subvention Awards, FY19-23

Publisher	FY19	FY20	FY21	FY22	FY23	Grand Total
Nature	\$15,435.00	\$11,580.00	\$12,975.00	\$9,980.00	\$16,000.00	\$65,970.00
Wiley	\$9,805.00	\$6,455.00	\$13,160.00	\$9,040.00	\$13,250.00	\$51,710.00
MDPI	\$1,355.62	\$21,137.35	\$2,241.92	\$9,832.04	\$7,103.78	\$41,670.71
PLoS	\$6,587.00	\$1,595.00	\$12,429.00	\$11,409.00		\$32,020.00
Elsevier	\$5,138.00	\$2,725.00	\$2,000.00	\$7,000.00	\$7,700.00	\$24,563.00
Springer Nature		\$5,842.00	\$7,923.00		\$4,000.00	\$17,765.00
AAAS		\$5,000.00	\$4,000.00	\$3,500.00	\$3,120.00	\$15,620.00
IOP Publishing		\$4,000.00		\$4,255.00	\$3,928.00	\$12,183.00
Taylor & Francis	\$5,850.00	\$300.00		\$2,000.00	\$4,010.00	\$12,160.00
Frontiers	\$1,858.50	\$5,097.00	\$3,180.00	\$2,000.00		\$12,135.50
EGU Publications	\$4,000.00	\$2,000.00	\$2,076.69	\$3,386.00		\$11,462.69
OSA Publishing		\$5,960.00		\$3,685.00		\$9,645.00
Oxford University Press	\$1,350.00	\$1,350.00	\$2,431.00	\$2,800.00	\$1,500.00	\$9,431.00
SAGE		\$750.00	\$1,500.00	\$1,500.00	\$2,320.00	\$6,070.00
American Society of Microbiology			\$2,000.00	\$2,000.00	\$2,000.00	\$6,000.00
Optical Society of America	\$3,922.00	\$1,980.00				\$5,902.00
Ubiquity Press	\$4,350.00		\$685.00		\$525.04	\$5,560.04
AGU	\$1,800.00	\$1,800.00	\$655.00			\$4,255.00

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eLife					\$4,000.00	\$4,000.00
American Physical Society			\$2,000.00	\$2,000.00		\$4,000.00
AIP Publishing				\$2,000.00	\$2,000.00	\$4,000.00
Cell Press	\$2,000.00		\$2,000.00			\$4,000.00
BMC		\$3,915.50				\$3,915.50
APS Physics	\$1,900.00		\$2,000.00			\$3,900.00
Resilience Alliance	\$2,520.00	\$1,075.00				\$3,595.00
Cambridge University Press	\$1,764.00	\$690.00				\$2,454.00
APS					\$2,250.00	\$2,250.00
European Geosciences Union		\$2,160.48				\$2,160.48
Optica Publishing Group					\$2,020.00	\$2,020.00
eLife Sciences Publications		\$2,000.00				\$2,000.00
JMIR				\$2,000.00		\$2,000.00
Hindawi-Wiley					\$2,000.00	\$2,000.00
JAMA Network		\$2,000.00				\$2,000.00
InTech	\$1,856.81					\$1,856.81
MIT Press		\$1,750.00				\$1,750.00
IEEE		\$1,750.00				\$1,750.00
Academic Journals			\$1,540.00			\$1,540.00
The Company of Biologists	\$1,495.00					\$1,495.00
University of California Press		\$1,450.00				\$1,450.00
Copernicus					\$1,350.52	\$1,350.52
Cogitatio		\$1,036.31				\$1,036.31
EDP		\$1,020.64				\$1,020.64
International Association for the Study of the		\$806.12				\$806.12

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Commons						
Pensoft					\$763.04	\$763.04
American Chemical Society		\$750.00				\$750.00
De Gruyter					\$738.00	\$738.00
The Center for Transformative Action				\$500.00		\$500.00
Network Design Lab		\$100.00				\$100.00

Grand Total	\$72,986.93	\$98,075.40	\$74,796.61	\$78,887.04	\$80,578.38	\$405,324.36
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