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Public Domain and Paywalled: Journal Articles Authored or Co-authored by U.S. Government Employees

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Abstract

Academic journal articles authored by U.S. government employees are assumed to be in the public domain, though journals vary in communicating this status, and access is often not provided. To document this situation, between September 2020 and March 2021 we collected and analyzed copyright statements from a random sample of articles in PDF published in 2019 by authors affiliated with two U.S. government agencies. 13% of the sampled articles had a copyright statement indicating the U.S. public domain or U.S. government authorship. 42% of the published versions of the sampled articles were behind a paywall. Even when all authors of an article were U.S. government employees, 29% were labeled in the U.S. public domain, and 66% were behind a paywall.

While copyright notices are not required, notice provides legal certainty on the usage of journal articles, which are shared among scholars, added to bibliographic managers, and posted to websites and repositories. Journal articles authored by U.S. government employees may be a source of open access that has not been fully realized, and uniquely, a retrospective source of access for scholarship. We suggest best practices for journal publishers, as well as possible actions by U.S. government agencies, library organizations, and institutional repositories. The U.S. public domain provides an opportunity to increase the number of peer-reviewed journal articles that are open access.

Public Domain and Paywalled: Journal Articles Authored or Co-authored by U.S. Government Employees

Introduction

In the United States, works of the federal government are not copyrightable (17 USC § 105). This status covers any "work prepared by an officer or employee of the United States Government as part of that person's official duties" (17 USC § 101). While it is generally understood that works issued by the federal government are in the public domain, the government also employs many researchers who publish articles in peer-reviewed journals. Most of those articles are co-authored with non-U.S. government employees, often university researchers. As such, a peer-reviewed journal article can be considered a "joint work" in which author contributions are merged into a unitary whole (17 USC § 101). In most cases, it would not be possible to identify the specific contributions of a U.S. government author from those of co-authors.

In the course of our work as librarians, we have noticed variability in copyright statements and article access for peer-reviewed journal articles authored by one or more U.S. government employees. While there is no requirement for copyright labeling (17 USC § 103), it is important for identifying the legal status of the article under copyright. In this era of increasing open access to scholarly literature, readers need to know what uses of an article are permitted.

Variability in copyright statements and article access for articles authored by U.S. government employees led to our research questions. First, how do journals designate the copyright status of articles authored or co-authored by U.S. government employees? Second, what is the access status of these articles?

Literature Review

There is very little literature addressing peer-reviewed journal articles authored or co-authored by U.S. government employees, and none addressing journal practices in these cases. The literature on government-authored works exposes more questions than answers, provides nuances, and quickly ropes in other complex areas of copyright including co-authorship, international copyright, and scholarly publishing practices. The legislative history of section 105 (House report no. 94–1476) surfaces some of these issues with interests from a variety of governmental voices including the National Technical Information Service, U.S. Postal Service, as well as international implications (17 U.S.C. §105). The work by Ringer and Flacks (1980) includes additional legislative voices from NASA and the Department of Defense, concluding that "The copyrightability of works of the U.S. government was a controversial issue throughout the long period of Congressional consideration of the bill that became the Copyright Act of 1976" (p. 159, footnote 4). Despite the complexities of looking at legislative interests, the concluding paragraph of House report no. 94–1476 does articulate a wide intent for the government and its authors to share these works: "The effect of section 105 is intended to place all works of the United States Government, published or unpublished, in the public domain. This means that the individual Government official or employee who wrote the work could not secure copyright in it or restrain its dissemination by the Government or anyone else, but it also means that, as far as the copyright law is concerned, the Government could not restrain the employee or official from disseminating the work if he or she chooses to do so. The use of the term "work of the United States Government" does not mean that a work falling within the

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definition of that term is the property of the U.S. Government." (17 U.S.C. §105). The Association of Research Libraries (2015) developed an overview highlighting the statutory foundations for the public domain status of U.S. government works. Tresansky (1981) examines the implications of case law and the legislative history on government produced works. Interestingly, Tresansky concluded that one should be cautious in a wide interpretation of applying public domain status to all government works, and with regard to commissioned scholarly works asserts that, "Thus, a copyright would exist in an article authored by a government employee at the direct request of a publisher or editor of a private publication, even though the article was written on government time and its content related to the author's official duties." (p. 615). However, most peer-reviewed journal articles are not commissioned (or "invited"). Exceptions to public domain attribution for U.S. government employees include the ability of faculty at military institutions to retain copyright for their published scholarship (Lape, 1992; Marine Corps University, n.d.).

The issue of international copyright for governmental works that are in the public domain in the originating country was raised by the U.S. Delegation at the Second Ordinary Session of the Intergovernmental Copyright Committee (IGCC) of the Universal Copyright Convention (UCC) in 1977 and resulted in a report by the U.S. Copyright Office (Ringer & Flacks, 1980). This report analyzes a variety of factors and ultimately concludes that the U.S. government works should have international copyright protection even though they are in the public domain in the U.S. (Ringer & Flacks, 1980). Ringer & Flacks (1980) also present a legislative history of the Copyright Act of 1976 regarding international expectations for U.S government works that demonstrates clear intent for the U.S. government to assert copyright overseas. In particular, H.R. Rep. No. 94-1476 (as noted in the U.S. Code Historical and Revision Notes) stated "The prohibition on copyright protection for United States Government works is not intended to have any effect on protection of these works abroad. Works of the governments of most other countries are copyrighted. There are no valid policy reasons for denying such protection to United States Government works in foreign countries, or for precluding the Government from making licenses for the use of its works abroad." (17 U.S.C. §105)

Co-authorship is likewise a thorny copyright issue, which is compounded with U.S. government co-authors. U.S. copyright law defines a "joint work" as work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole (17 USC § 101.). Further, each co-author is an equal owner of the copyright in the work, unless there is an agreement to the contrary (17 USC § 201.). Rozencwaig-Feldman's (2021) presentation of a new hypothetical model for joint authorship includes a review of U.S. case law dealing with thresholds for joint authorship that details many ongoing uncertainties and inconsistencies. The complexity of co-authorship in scholarly publications is not limited to U.S. copyright law. While focusing on EU copyright law and scientific knowledge production, Priora (2019) presents an excellent literature review of co-authorship including international variances. In surveying the copyright landscape regarding co-authorship Priora asserts, "EU copyright framework neither includes a comprehensive body of harmonized rules on co-authorship nor displays prospective plans to do so, while the related national regulations present highly diverging approaches." (p. 1).

Parallel to the legal landscape of copyright and co-authorship, there has been considerable focus within the academy on properly crediting contributions, especially considering incentive structures (Jaime A. Teixeira da Silva & Judit Dobránszki 2016; Seymore 2006). Evolving co-authorship norms and expectations are also found among a variety of disciplines and professional editorial organizations (Committee on Publication Ethics, n.d.; Council of Science Editors n.d.; International

Committee of Medical Journal Editors, n.d.; World Association of Medical Editors, 2007). Similarly, the Contributor Roles Taxonomy, CRediT (National Information Standards Organization), distinguishes 14 authorship roles, although it is not clear how those roles would interact with copyright law. Extending work on examining scholarly publisher's alignment with co-author guidelines from groups such as COPE, ICJME, and CRediT, Texeira da Silva and Al-Khatib (2021) argue that existing scholarly publishing practice of receiving a copyright transfer agreement (CTA) from only the corresponding author is not only at odds with ethical practices but also creates potential liability by omitting authors with legitimate copyright interests and rights. While they do not specifically address U.S. government authors, they include authors' employers and institutions as those often left out of current CTA practice. Texeira da Silva and Al-Khatib (2021) call for publishers to do better, saying "..we believe that because copyright enables most publishers to own, disseminate and control all research articles published in their journals, publishers are responsible for the integrity and accuracy of the scientific record, and should thus implement the practice of ensuring that all copyright owners consent and authorize the transfer of copyright from the true owners to a publisher prior to publication of scientific articles.." (p. 8). It is interesting to note that the current Wiley CTA does not aspire to this level of responsibility and asserts that "if at least one author is not a U.S. government employee, it is not a U.S. government work" (Wiley, 2021). CENDI (a U.S. interagency group from Commerce, Energy, NASA, Defense Information), on the other hand, states in their copyright FAQ document: "When the U.S. Government is joint author with a non-government entity, the law on how much of the work is protected by copyright is unsettled and is thus open to differing interpretations. In such situations, you should consult your Office of General Counsel" (CENDI 2017).

In this complex environment, variation in the copyright labeling of scholarly articles with U.S. government authors is to be expected, but little evidence is available to determine if that is the case. Klein (2009) discusses areas where the U.S. government can hold copyright, especially for commissioned works, and calls for the government to "unambiguously mark and tag" works to avoid "confusion and uncertainty" for readers. Heald (1994) proposes four causes of action against commercial practices of incorrectly asserting copyright for public domain works, including potential remedies to consumers such as class actions. Mazzone (2011) likewise discusses causes of action in his book on copyright overreach, additionally proposing a registry of public domain works and a symbol similar to the copyright symbol to clearly mark works in the public domain. Royster (2014), in critiquing a NISO proposal for open access metadata standards, includes eight examples of labeling of U.S. government works, in which publishers asserted copyright that was presumably beyond their reach. Hinchliffe and Nowlan (2022) likewise found divergence, inconsistency, and potential for user confusion when analyzing how open access is indicated on journal articles. Hathcock (2016) noted conflicting copyright statements on the same work as part of her critique of the ethical dimensions of copyright and reuse. Accurate copyright labeling is an explicit expectation in the "Principles of Transparency and Best Practice in Scholarly Publishing" that in part states that the "copyright terms for published content should be clearly stated on the website and in the content" (The Committee on Publication Ethics (COPE), Directory of Open Access Journals (DOAJ), the Open Access Scholarly Publishing Association (OASPA), and the World Association of Medical Editors (WAME), 2022). Beyond these related studies, there has not been a deeper examination of copyright labeling of U.S. government works, or a study to tease out specific implications for these works, their authors, and their readers.

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Methods

Bibliographic information for journal articles published in 2019 with an author affiliation of the National Cancer Institute (NCI) or the U.S. Department of Agriculture (USDA) was retrieved from the Clarivate Web of Science Core Collection. The datasets were gathered by entering "United States Department of Agriculture (USDA)" or "National Cancer Institute (NCI)" in the "Organization - Enhanced" index, and then limiting the results by the year 2019 and the "Article" type. Results for each search were exported to separate spreadsheets, and the metadata fields were reduced to the journal name and the article's digital object identifier (DOI). Some results were deleted from each dataset, including results marked "book" or "series", as well as duplicate records. During the manual examination of each article, additional records were omitted when it became clear that an author did not contribute to the article while an employee of USDA or NCI (for example, a note that an author was "currently at USDA", such as in https://doi.org/10.3390/metabo9060114).

For the USDA, this search resulted in 6,145 results (retrieved September 18, 2020). After removal of the records described above, the results contained 6,033 items. For the NCI, this search retrieved 2,378 results (retrieved December 1, 2020). After record removal, the NCI results contained 1,835 items. Since metadata for thousands of articles were retrieved, a smaller set of articles for manual analysis was needed. Exported search results from Web of Science are in reverse chronological order by default. A random number column was created in the spreadsheets in order to re-sort the results in random order. Once randomized, the authors analyzed 362 USDA articles and 318 NCI articles, sample sizes sufficient for a 95% confidence level and 5% margin of error.

The authors then used the DOIs in the dataset to retrieve the article web page, access the article in portable document format (PDF), and record any copyright statement present on the PDF. This work was completed between September 18, 2020, and March 1, 2021. The PDF was chosen as the source of copyright information because it is fixed yet portable, and is frequently stored in bibliographic managers, hosted on non-publisher websites, and exchanged by researchers. Therefore, it is important that the PDF version contains accurate copyright information. However, we note that the "Version of Record" (VoR) designation from NISO (2008) is not format specific.

The copyright statement on the PDF, when present, was copied and pasted into the spreadsheet for each item. To facilitate analysis, an adjacent spreadsheet column was used to categorize the statement into one of five types:

1. Missing (no copyright statement found on the PDF)
2. Generic journal copyright statement (e.g., © copyright the publisher or society)
3. Creative Commons license
4. U.S. public domain (explicitly acknowledging U.S. government authorship in some manner)
5. CC0 public domain dedication.

A few articles acknowledging the U.S. public domain also had a second copyright statement or license but were placed in the U.S. public domain category. For those articles acknowledging the U.S. public domain, further categorization was done to designate if the copyright statements included the following: U.S. government authorship; the words "public domain"; acknowledgment of international copyright limitations; or a copyright symbol. Once all the copyright statements from the random samples were compiled and categorized, analyses were carried out by column sorting or pivot tables.

In addition to information on copyright labeling, the dataset was supplemented with information on each item's access status and publisher. Most of this data was obtained by entering DOIs into the Unpaywall Simple Query Tool on July 8, 2021. Specifically, three columns were added to the dataset through the Unpaywall query: publisher, open access designation (True/False), and best open access version (acceptedVersion, publishedVersion, submittedVersion, Null). Two entries in the dataset did not have DOIs (one from USDA and one from NCI) and in these cases the articles were manually inspected for publisher and open access status. Publishers were identified with data from Unpaywall, except for a group of 12 articles that were labeled "Scholarly Societies" which upon inspection were from only two societies. A parenthetical statement was added to the publisher fields for these 12 articles indicating the specific publisher. Through a combination of manual inspection and comparison with the Unpaywall results, a column was also added to the dataset to determine if the published version of articles with a public domain copyright label were openly available. These additional fields regarding publisher and access status were also analyzed by column sorting and pivot tables. The USDA dataset underwent further manual analysis to identify articles for which all authors were USDA-affiliated, in order to determine whether lack of a "joint work" affected copyright labeling or access status by journals.

Results

Across the combined sample of articles with U.S government authors or co-authors (n=680), 86 articles carried some type of U.S. public domain designation (13%), 312 asserted publisher copyright (46%), 192 had a Creative Commons license (28%), 71 lacked a copyright statement (10%), and 19 had a CC0 public domain dedication (3%). The USDA and NCI datasets did not vary significantly from the combined dataset. For the NCI random sample (n=318), 150 articles had a publisher copyright statement (47%), 90 had a Creative Commons license (28%), 35 acknowledged the U.S. public domain (11%), 34 lacked a copyright statement (11%), and 9 had a CC0 public domain dedication (3%). For the USDA random sample (n=362), 162 articles had a publisher copyright statement (45%), 102 had a Creative Commons license (28%), 51 acknowledged the U.S. public domain (14%), 37 lacked a copyright statement (10%), and 10 had a CC0 public domain dedication (3%).

Within the USDA random sample (n=362), 35 articles were identified in which all of the authors were USDA employees (10%). These articles showed a higher rate of U.S. public domain designations, with 10 articles marked public domain (29%), alongside 10 articles lacking a copyright designation (29%), 8 with publisher copyright (23%), 6 with a Creative Commons license (17%), and one CC0 public domain designation (3%) [Figure 1].

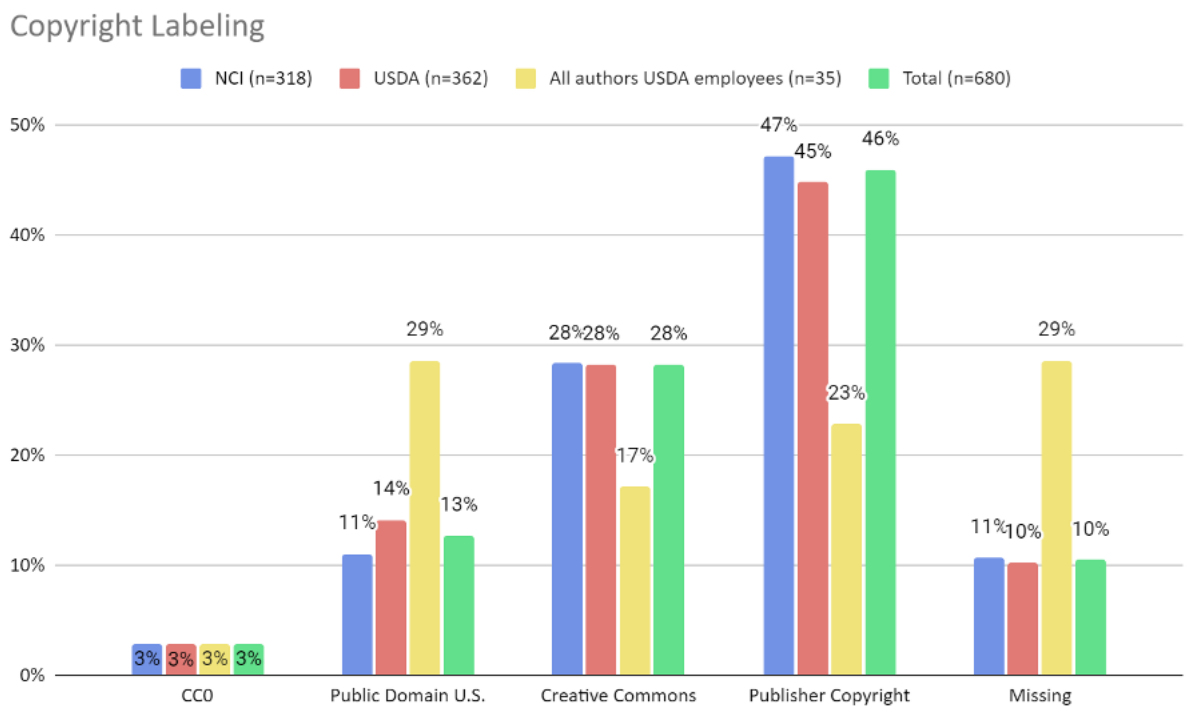

Figure 1.

While the copyright labeling practices were similar for articles authored or co-authored by NIH and USDA researchers, disciplinary differences were found when looking at the open access status of the articles in the sample dataset with specific attention to the published version. The Unpaywall Simple Query Tool was used to determine open access status and open access version. 215 of the 318 NCI articles had the published version available open access (68%) whereas 176 of the 362 USDA articles were available open access in the published version (49%). Of the articles from the combined sample with a public domain copyright label, 50 of 86 total were available for the open access published version (58%); 22 of the 35 NCI articles (63%); and 28 of the 51 USDA articles (55%). From the subset of 35 articles with all authors from the USDA, 13 were available open access in the published version (37%). Copyright labeling practices for the articles in the combined sample in which the published version was available open access was as follows, 19 CC0 (5%); 50 Public Domain U.S. (13%), 191 Creative Commons (49%); 110 Publisher Copyright (28%), and 21 Missing (5%). For these articles available open access with the published version, some disciplinary differences were likewise seen regarding their copyright labeling [Figure 2].

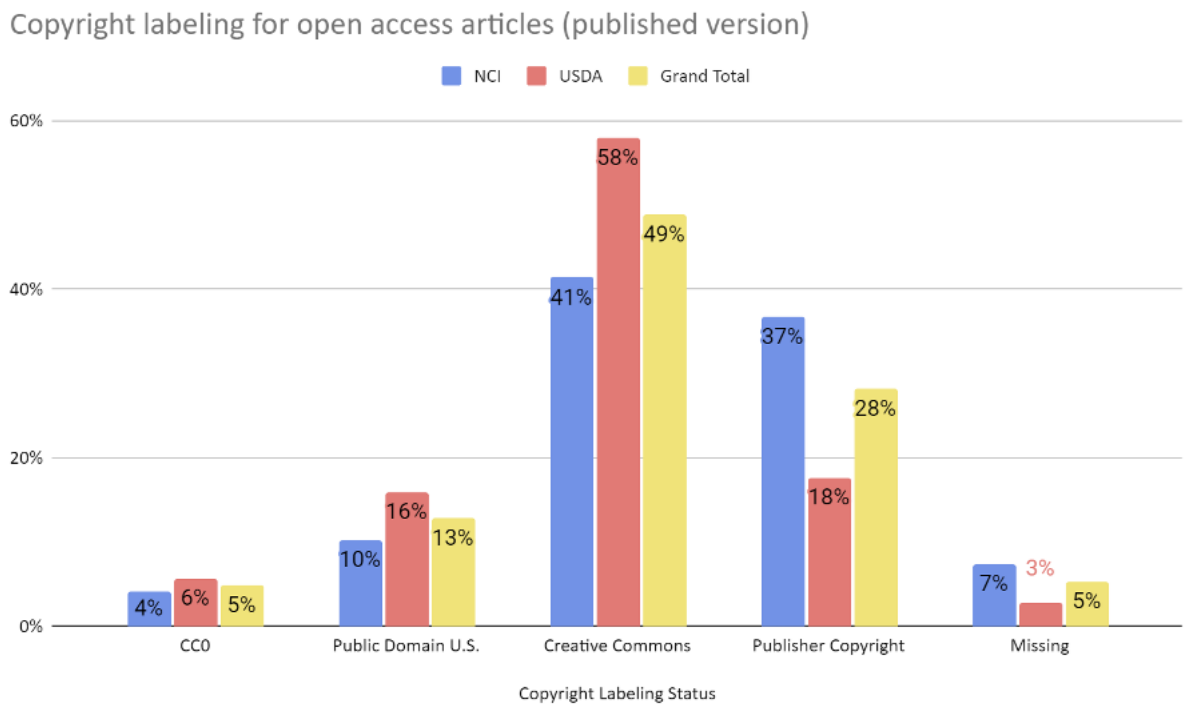

Figure 2.

A few trends emerge in the copyright labeling practices by publishers within the sample dataset. As noted, the publisher for each article was largely established through the Unpaywall Simple Query Tool. There were 77 total publishers in the combined sample dataset of 680 articles. Three publishers (Elsevier, Wiley, and Springer) accounted for a majority of the articles (387 articles, 55%). Each of these publishers had different profiles regarding copyright labeling for U.S. government authored works [Table 1]. In asserting publisher copyright on the articles, Wiley led the top three publishers with 63 of 108 articles (58%) followed by Elsevier with 80 of 160 articles (50%) and Springer with 41 of 103 articles (40%). Elsevier (with 160 articles accounting for 24% of the entire combined dataset) only indicated U.S. public domain on 3 of its articles (2%). Further, 53 of the articles published by Elsevier in the sample dataset provided no copyright statement at all (33%). Of the 86 articles without any copyright statement in the entire sample dataset, Elsevier's 53 articles accounted for 55% of all missing copyright statements. In contrast, Springer and Wiley rarely omitted the copyright statement (2% and 1% respectively). They also designated the U.S. public domain at a much higher rate than Elsevier and more in line with findings from the entire sample dataset with 18% (Wiley) and 23% (Springer).

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Table 1.
Copyright labeling practices of top three publishers (by number of articles in dataset)

	Elsevier	Wiley	Springer
CC0	0.00%	0.00%	0.00%
Publisher Copyright	50.00%	58.33%	39.81%
Creative Commons	15.00%	21.30%	35.92%
Missing	33.13%	1.85%	0.97%
U.S. Public Domain	1.88%	18.52%	23.30%
Total articles	160	108	103
Percent of Grand Total (680 articles)	23.53%	15.88%	15.15%

Open access publishers presented a different profile. MDPI (43 articles) and Frontiers (17 articles) used Creative Commons licenses exclusively, without either a publisher copyright or U.S. public domain designation in their statements. Public Library of Science (PLoS) accounted for almost all CC0 licenses in the dataset (18 of 19) and used CC0 95% of the time for their article labeling. When contacted about this result, PLoS stated that their practice is to use CC0 on articles with a U.S. government author (A. Musson, personal communication, May 13, 2021).

Of the 86 articles that were classified as having some type of U.S. public domain designation from the 680-article sample, there was variation in the language used. 78 of these specifically cited U.S. government authorship, while 8 simply declared that the article was in the public domain with no explanation. 67 of the 86 articles included some reference to the international limitations either by noting that the specific copyright status was valid "in the U.S." and/or that "foreign copyright protection" may apply. 45 of the 86 article copyright statements included the words "public domain". 35 of the 86 article statements included all three designations: U.S. authorship; international limitations; and "public domain". More than a third (31 of 86) included a copyright symbol. This variation was seen across and within publishers [Table 2].

Table 2.
Variation of Copyright labels that acknowledge U.S. government public domain

Statement (DOI)	Publisher
This manuscript was prepared, in part, by a U.S. Government employee on official time, is not subject to copyright and is in the public domain. © 2019 Elsevier Ltd. All rights reserved. (j.firesaf.2019.04.009)	Elsevier BV
© This is a U.S. government work and not under copyright protection in the U.S.; foreign copyright protection may apply 2019 (10.1007/s11207-019-1505-8)	Springer Science and Business Media LLC
© This is a U.S. government work and its text is not subject to copyright protection in the United States; however, its text may be subject to foreign copyright protection 2019 (10.1007/s10552-018-1102-4)	Springer Science and Business Media LLC
Published 2018. This article is a U.S. Government work and is in the public domain in the USA (10.1002/cche.10117)	Wiley
This article has been contributed to by US Government employees and their work is in the public domain in the USA. © 2019 John Wiley & Sons, Ltd. (10.1002/fam.2743)	Wiley
Not subject to US Copyright. (10.2135/cropsci2018.05.0323)	Wiley

Discussion

The results of this study indicate that current copyright labeling practices of articles authored or co-authored by U.S. government employees are inconsistent. Further, among the top publishers in the sample, there are divergent labeling approaches, none of which advance the sharing and advancement of scholarship. Full copyright statements provide legal certainty to users. Wiley's copyright transfer agreement states that articles with U.S. government co-authors are not in the U.S. public domain (Wiley, n.d.). Therefore, it is not surprising that Wiley had the highest rate of claiming copyright with no other acknowledgement. Elsevier, on the other hand, may be acknowledging the public domain of many of the articles in the sample by not including any copyright statement beyond a generic "Published by Elsevier". While accurate copyright labeling provides end user clarity, the study did not find consistent relationships between the open availability of articles and U.S. public domain declarations. The percentage of the open availability of the published version decreased for NCI articles from 68% of the total sample to 58% for those with a public domain declaration whereas for the USDA articles open availability of the published version increased from 49% of the total sample to 55% of articles in the sample with a public domain label.

In addition to copyright labeling practices, this study reveals the open access status of journal articles authored by U.S. government employees. A Web of Science search over the past 5 decades for articles from these two agencies alone demonstrates the full scale of historical knowledge that is

locked up (and the growth of open access in recent years). From 1971-2020, Web of Science search results show that through the Open Access filter, 188,900 USDA or NCI articles are not open access in any form (green, gold, or bronze) [Figure 3]. While the public domain status of these works does not legally require open access, in practice the open distribution is currently stifled. In short, the promise of U.S. copyright law for sharing knowledge of U.S. government authored works is not being met by either the copyright labels or actual availability of these articles.

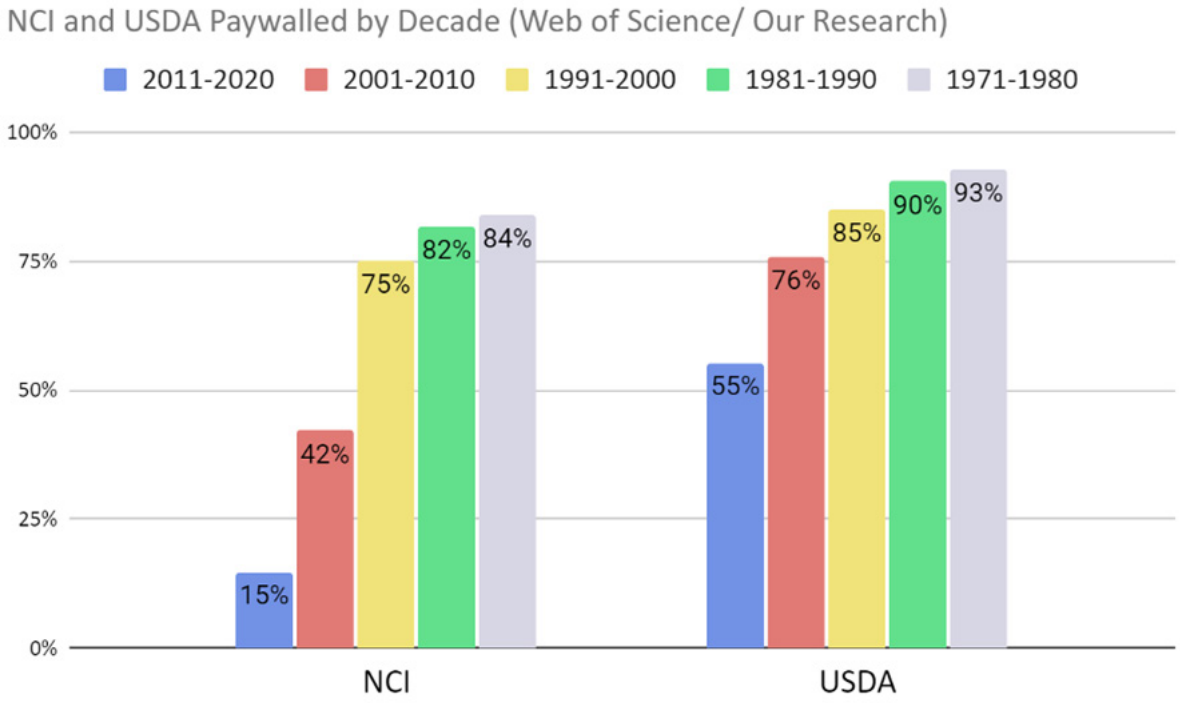

Figure 3.

These results of inconsistent copyright labeling and the estimated scale of government authored or co-authored works behind paywalls should challenge information professionals and scholars to further open this content in alignment with common goals of advancing learning and discovery. Beyond lack of reader access to the journal articles, the current walled state of this corpus frustrates innovative re-uses that the public domain status should encourage, such as machine-readable texts or open educational resources. The 2022 *Memorandum for the Heads of Executive Departments and Agencies: Ensuring Free, Immediate, and Equitable Access to Federally Funded Research* from the Office of Science and Technology Policy, echoes these points in both calling for "broad and expeditious sharing of federally funded research" and specifically noting the importance that such research publications should include "any use and re-use rights, and which restrictions, including attribution, may apply" (Nelson, 2022).

There are a few potential strategies for remediating and preventing these barriers. The most direct solution would be for scholarly publishers (in alignment with their stated values as partners in the research enterprise) to open these works on their platforms and label them correctly with consistent public domain notices. Barring that, other approaches will be needed to address newly published works as well as the large backfile of closed public domain articles.

For works published in the future, advocacy to government authors to understand copyright in their works, and to publishers to improve their practices would be an important step. Advocacy to publishers could leverage the influence of libraries and extend to license agreements to require consistent labeling and open access for government produced works. As referenced in the literature review, copyright transfer practices that rely on a single corresponding or lead author can be problematic and overlook the interests and obligations of co-authors. Finding twice as many public domain declarations for the subset of articles where all authors were USDA employees amplifies this. It is not, however, a panacea for copyright labeling issues, as only 29% of those articles contained a public domain statement. Leveraging the efforts of RightsStatements.org (n.d.), specifically their "No Copyright - United States" statement could be a strong model of consistent copyright labeling. The emergence of Creative Commons licenses also helps open this literature. While Creative Commons licenses are not the same as public domain, they open the literature for international scholarly access and re-use. Another complicating factor is for government authors who might wish to use a Creative Commons license but find the international license in conflict with the protections in U.S. copyright law, where the U.S. government reserves the right to assert copyright internationally.

One remedy (despite current global nationalistic tensions) would be to legislatively acknowledge that given the worldwide nature of scholarly publishing and research, it is not desirable or practical to only extend rights domestically for this subset of government produced or co-authored works. Government agencies could also take initiative to share and disseminate copies of these articles in alignment with their missions. One notable example of this approach is the U.S. Forest Service's *Treesearch*; "sharing free, full text publications by Research and Development scientists in the U.S. Forest Service… published by the agency as well as those published by others, including papers appearing in journals, conference proceedings, or books" (U.S. Forest Service, n.d.).

It is also worth thinking about strategies to open this large body of historical work that is currently behind paywalls. From a copyright standpoint, it is worth noting 17 U.S.C. § 403 requires that for a copyright notice to be valid it must indicate if the work is "predominantly" of the U.S. government (P. Hirtle, personal communication, May 17, 2021). Without a valid copyright notice, works published between 1978 and March 1, 1989, are in the public domain. At the individual library and institution level, institutional repositories could collect and disseminate this work in instances where there is an institutional co-author. Additionally, items with the status "no OA copy" in Unpaywall could be prioritized. Articles would need to be legally obtained, and providing access could violate licensing agreements if the copy is retrieved from an online publisher. If licensing agreements present a barrier, one possibility is for libraries to digitize print copies. The recent Elsevier and NERL retrospective open access agreement, that in part will open 15 years of previous work from participating institutions' researchers, could present a path for others to include government produced (and other public domain) material in such a licensing model (Elsevier, 2022).

The collective power of consortia and member organizations could also liberate this historical body of public domain material. Groups such as HathiTrust, Center for Research Libraries, Library of Congress, or other large, shared collections, could assert the public domain status of these works and provide access for online scholarly use. An initial step might be to have a shared registry of this work to fully understand the scope of this group of articles that likely exceeds a million articles (NCI and USDA alone account for almost 200,000 articles). Such a collective registry could be informed by retrospective copyright research for monographs such as the Historical Copyright Records and Transparency project (New York Public Library, 2019).

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The international perspective is worth mentioning if greater access is provided to works by U.S. government employees. In this case, copyright, or lack thereof, is jurisdictional, and related to, but separate from, the ability to access research. If these works have the status of public domain in the United States, then access must be provided in the United States. Because the internet is global, online access provided in the U.S. would provide availability everywhere, though works accessed outside the U.S. would remain under copyright, limiting sharing and reuse. Geofiltering could be used by publishers to provide access to U.S.-based IP addresses, and prevent access from other countries, though there are ways of defeating filtering based on location. While publishers are under no legal obligation to provide a full and correct copyright notice, or to provide access when items are in the public domain, the scholarly community could make these actions an expectation or convention, like the citing of sources or providing a DOI. Currently, scholars may find journal articles clearly identified as public domain in the U.S., while simultaneously paywalled to them and U.S. internet users. As we propose above, such articles, if accessed legally, could then be uploaded to repositories, as the U.S. Forest Service has done, to provide access not just in the U.S., but globally.

In addition, it is worth considering the interaction of Creative Commons (CC) licenses with the U.S. public domain. In its latest iteration (4.0), CC licenses are international (in its previous iteration, 3.0, licenses were "ported" to jurisdictions). The Attribution license (CC BY) used by open access publishers like Frontiers and MDPI provides little difference from the public domain from a user's perspective, since attribution is a standard in scholarship, regardless of the copyright status of the cited work. However, other CC licenses, which place restrictions on re-use regarding commercial use, derivatives, and subsequent licensing, impinge on possible usage under the U.S. public domain. Therefore, we suggest that open access publishers using any CC license additionally acknowledge the U.S. public domain, or, like PLoS, make an international public domain dedication (CC0).

Limitations

Our findings have several limitations. Though we provide access to the study data, some comes from a proprietary source, the Clarivate Web of Science Core Collection (WoS). Those without access to it, or to the paywalled PDFs, will be unable to reproduce our methods. While we would have preferred a non-proprietary source, an identical search for the USDA affiliation in Lens (lens.org) in September 2020 retrieved 2,635 articles, compared to 6,145 for WoS. We found the WoS affiliation filter very accurate, and no article in the random samples (combined n=680) showed an incorrect or absent USDA or NCI affiliation. Additionally, the WoS Core Collection includes only a selection of all journals and has a STEM focus.

Only one year was evaluated, 2019, for only two U.S. government units, the National Cancer Institute and the United States Department of Agriculture. Since article access changes over time, the open access designations are limited to when they were evaluated and may not fully represent the current availability of all the articles in the sample. Unpaywall data on access status and publisher name could contain errors. It is also possible that manual evaluation of PDF files may have resulted in error. Finally, we cannot know with certainty whether all articles in the study were written as part of a U.S. government employee's "official duties."

Future Study

Future research could address other U.S. government agencies, or all U.S. government authors. While this study focused on peer-reviewed journal articles, other material types could be considered, such as book chapters or conference proceedings. Since some U.S. states place government work in the public domain, works by those authors could be examined. We did not investigate whether licensing agreements with publishers would prevent institutions from providing access to articles in the U.S. public domain, nor did we investigate publisher policies regarding the copyright status of works authored or co-authored by U.S. government employees. While we discovered that the U.S. Forest Service collects and disseminates journal articles authored by its employees, we did not investigate whether this practice is followed by other U.S. agencies. We also did not investigate the potential use of geofiltering by publishers, through which access could be provided to articles in a jurisdictional public domain but not elsewhere (though workarounds exist). Surveys of U.S. government authors could reveal their level of copyright knowledge and opinions on the access status of their articles.

Conclusion

There is a strong argument that scholarly journal articles authored or co-authored by U.S. government employees in the course of their duties are, with only a few exceptions, in the public domain under U.S. copyright law. A random sample of scholarly journal articles from the year 2019 with U.S. government authors or co-authors from the Department of Agriculture and the National Cancer Institute showed inconsistent copyright labeling, with only 13% indicating the U.S. public domain or U.S. government authorship. Of those articles with such an indication, there was wide variation across publishers in terms of the language used in a copyright statement. Further, only 58% of the published versions within the sample of articles could be openly accessed, which points to the larger problem of access to millions of scholarly journal articles authored or co-authored by U.S. government employees.

In reviewing the literature, results from this study, and contemporary calls to further open U.S. government funded research for the public good, we strongly recommend that a clear copyright statement appear on all journal article formats, including licensing conditions and public domain acknowledgements. We also recommend that access be provided to all articles authored or co-authored by U.S. government employees. Access could be provided by publishers, or otherwise by government agencies, library organizations, or individual repositories. These recommendations could be strengthened by their inclusion in licensing agreements between libraries and publishers.

Link to Dataset: https://doi.org/10.17605/OSF.IO/HK68U

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