



Request for Information: Public Access to Peer-Reviewed Scholarly Publications Resulting From Federally Funded Research

Office of Science & Technology Policy

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Response from Enabling Open Scholarship (EOS)

A. Opening statement

Open Access to federally-funded research will advance American science and technology, speed up research, reduce duplication, increase the usage and impact of research, facilitate interdisciplinary research, improve the quality of research because greater scrutiny will be possible, enable the deployment of new semantic technologies to create new knowledge from existing research findings, provide the wherewithal for better, smarter research assessment and management and provide greater payoff for the US taxpayer from the funds invested in research across all federal agencies.

A number of constituencies will benefit: as well as the research community itself, which will have immediate and untrammelled access to the information it needs to do its work, the professional, practitioner and lay public communities will also benefit. These things will lead to wealth creation, improvement in the quality of life and a better informed populace in an increasingly scientific/technological world. Access must be made available in ways that permit full re-use of research results and through services that maximise ease of use and convenience for the relevant user constituencies. We elaborate on these points in our detailed response below. Our response is organised by answering the questions listed in the *Request For Public Comment*.

B. Enabling Open Scholarship (EOS)

EOS is an organisation of universities and research institutes worldwide whose managers have come together to discuss, shape and promote the principles of open scholarship. EOS has members on six continents, from the largest, broad-based universities and research institutes to some of the smallest, most specialized research-based institutions. As well as universities and research institutes, EOS also has government departments and research councils (analogous to the NSF or NIH) in several different countries as members. Board members are listed at the foot of the document.

C. EOS' responses to the questions in the Request For Information

(1) Are there steps that agencies could take to grow existing and new markets related to the access and analysis of peer-reviewed publications that result from federally funded scientific research? How can policies for archiving publications and making them publically accessible be used to grow the economy and improve the productivity of the scientific enterprise? What are the relative costs and benefits of such policies? What type of access to these publications is required to maximize U.S. economic growth and improve the productivity of the American scientific enterprise?

The argument that there can be economic benefits from public access is now substantiated by evidence.

First, the economic modelling work of the Australian economist, John Houghton, on the economic benefits of moving to a fully Open Access scholarly communication system has shown that there would be savings for all national economies studied (Australia¹, United Kingdom², The Netherlands³, Denmark⁴, USA⁵). Most importantly in the context of this response to the OSTP RFI, the US study – which modelled the economic effects of the Federal Research Public Access Act – showed that the incremental benefits of a mandatory Open Access policy over a period of transition of 30 years would be valued at some 8 times the costs of implementation, with the proportion accruing to the US itself of some 5 times the implementation costs.

The methodology used by Houghton has been criticised by some publishers for misrepresenting their costs, though his model is available for anyone to use and these publishers have never populated it with their own data to show what they believe is the true situation. At least they have not done this and made the findings publicly available. Nor have they made what they claim to be the true cost data available so that others might use them to populate the model. The criticisms from the publishers have been dealt with in a public statement by the sponsor of the UK study, the UK's Joint Information Systems Committee (JISC)⁶.

¹ Houghton J, Steele C and Sheehan P (2006) Research communication costs in Australia: Emerging opportunities and benefits: report to the Department of Education, Science & Training. <https://digitalcollections.anu.edu.au/handle/1885/44485>

² Houghton, J *et al* (2009) Economic Implications of Alternative Scholarly Publishing Models: Exploring the costs and benefits [United Kingdom study] <http://ie-repository.jisc.ac.uk/278/>

³ Houghton J, de Jonge J & van Oploo M (2009) Costs and Benefits of Research Communication: The Dutch Situation. http://www.surffoundation.nl/SiteCollectionDocuments/Benefits%20of%20Research%20Communication%20April%202009_%20FINAL_logos2.pdf

⁴ Houghton J (2009) Costs and benefits of alternative publishing models: Denmark. http://www.knowledge-exchange.info/Admin/Public/DWSDownload.aspx?File=%2fFiles%2fFiler%2fdownloads%2fDK_Costs_and_benefits_of_alternative_publishing_models.pdf

⁵ Houghton J (2010) Economic and Social Returns on Investment in Open Archiving Publicly Funded Research Outputs [US study] <http://www.arl.org/sparc/publications/papers/vuFRPAA/index.shtml>

⁶ JISC Response to: Some comments prepared jointly by The Publishers Association, the Association of Learned and Professional Society Publishers and the International Association of STM Publishers on the report "Economic Implications of Alternative Scholarly Publishing Models: Exploring the costs and benefits"

Second, there is the problem of access to research information for companies and the effects that this has on innovation. The European Commission's own *Community Innovation Survey* has shown that there is a 'weak link between innovative enterprises [mainly small- and medium sized businesses, SMBs] and public research institutes/universities' and that 'innovative enterprises find the information they need more easily from suppliers or customers than from universities or public research institutes'⁷. Another study on accessibility of university research to SMBs showed that while 71% of respondents in innovative companies find accessing articles fairly/very easy, 66% of respondents pay for access in the form of subscriptions or society memberships which is costly. Moreover, there is 'by definition, a minority (29%) for whom access was fairly or very difficult'⁸.

There is now some early evidence of the actual economic costs and benefits to SMBs from access problems. Work carried out in Denmark on behalf of the Danish Government [disclosure: one of us was a co-author on this study] showed that 79% of small-medium sized innovative businesses had problems accessing the basic scientific research information they need. Difficulties in accessing research articles costs €73 million (circa USD 94 million) *per annum* to Danish firms. Product development is delayed or abandoned without access to research articles. The value of academic research to sales is around €2.1 million (USD 2.7 million) per company *per annum* and the value of delays, in lost sales of new products, is around €4.8 million (USD 6.2 million) *per annum*⁹. The businesses surveyed for this study ranged from biotech companies through engineering, construction, software and environmental services to horticulture and plant breeding.

This issue has been explicitly acknowledged in the UK: the Minister for Science, David Willetts, has set up a working group to study how to broaden access to research article sand himself concludes that 'Research stimulates and fuels innovation and economic growth. So, to maximise UK innovation we need to maximise access to and the use of research findings'¹⁰.

Finally, a recent study has also underlined the benefits to the private sector in the UK from access to research results¹¹.

There is no reason to suppose that the need for scientific information is any less for similar innovative US companies than it is for Danish or British ones and anecdotal evidence indeed

<http://www.jisc.ac.uk/media/documents/publications/responseoneiaspmreport.pdf> by Houghton et al. & Oppenheim et al., commissioned by JISC (published January 2009)

⁷ Parvan, S-V (2007) *Statistics in Focus: Science and technology*, 81/2007.

http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-081/EN/KS-SF-07-081-EN.PDF

⁸ Ware, M (2009) Access by UK small and medium-sized enterprises to professional and academic information <http://www.publishingresearch.net/SMEaccess.htm>

⁹ Houghton J, Swan A & Brown S (2011) Access to research and technical information in Denmark (Adgang til forskningsresultater og teknisk information i Danmark) <http://www.fi.dk/publikationer/2011/adgang-til-forskningsresultater-og-teknisk-information-i-danmark>

¹⁰ <http://nds.coi.gov.uk/content/Detail.aspx?ReleaseID=421232&NewsAreaID=2>

¹¹ HOST (2011) Benefits to the private sector of Open Access to higher education and scholarly research. http://open-access.org.uk/wpcontent/uploads/2011/10/OAIG_Benefits_OA_PrivateSector.pdf

suggest they share the same problems¹². Maximising access to research information for these sectors enables them to do their innovative work more easily, with economic and social benefits that result for society at large.

(2) What specific steps can be taken to protect the intellectual property interests of publishers, scientists, Federal agencies, and other stakeholders involved with the publication and dissemination of peer-reviewed scholarly publications resulting from federally funded scientific research? Conversely, are there policies that should not be adopted with respect to public access to peer-reviewed scholarly publications so as not to undermine any intellectual property rights of publishers, scientists, Federal agencies, and other stakeholders?

Copyright is assigned to authors by law (unless the employer opts to assert rights over work produced by employees) with the expectation and recognition that authors will benefit from the opportunity for their work to be used and to have impact and benefits for others. Creators of scholarly works are rewarded in terms of career advancement and personal achievement by building on their findings themselves and by having others build on them also. There is no conflict with public access principles: indeed, increased access and use of scholarly outputs results in greater impact in academic terms (citations) and in other measures of societal value. Federal policy should acknowledge these points and either explicitly require authors to retain sufficient rights to make their work publicly available under any terms laid down by federal policies, or require that authors transfer sufficient rights to the relevant federal agency to enable the agency to make the work publicly accessible. This is not a novel position. It is the basis of the policy currently in existence at the NIH and, moreover, many universities around the world retain rights to make their researchers' work publicly accessible, or are formally assigned that right by their researchers by agreement.

Since copyright is always a bundle of rights rather than one entity, the right to publish the work and make money from that can be transferred to publishers through a Licence To Publish (LTP). Thus publishers' interests are also legally protected. A number of publishers do NOT require transfer of the full copyright bundle and are happy with an LTP¹³: there is no reason why this should not extend to the majority where prior policy conditions upon authors make this the reasonable and workable solution.

(3) What are the pros and cons of centralized and decentralized approaches to managing public access to peer-reviewed scholarly publications that result from federally funded research in terms of interoperability, search, development of analytic tools, and other scientific and commercial opportunities? Are there reasons why a Federal agency (or agencies) should maintain custody of all published content, and are there ways that the

¹² "With a small oncology company ... it is imperative that I have access to the literature. But small companies do not have the "deep pockets" necessary... The for-profit journal publishers have effectively barred access to key scientific information except to those who can afford their outrageous fees. Much of the most innovative work is being done at companies like mine that cannot afford to pay \$30+ per paper or pay per-search charges in abstracts or journal collections." Terence Dolak, SDR Pharmaceutical, New Jersey. http://blogs.openaccesscentral.com/blogs/ccblog/entry/unemployed_retired_might Lose_touch

¹³ <http://users.ecs.soton.ac.uk/harnad/Hypermail/Amsci/7801.html>

government can ensure long-term stewardship if content is distributed across multiple private sources?

There are reasons why a Federal agency should keep custody of all published content. The most important are: (i) for internal research management and monitoring purposes (ii) for preservation and curation (iii) so that the contents can be enhanced (better metadata, improved mark-up) to enable science to work better.

We suggest, however, that it is not necessary for content to be *deposited* centrally. If the right metadata schema is embraced by all relevant institutional repositories, it is technically simple to harvest the content appropriate for the relevant Federal agency's own archive.

This is the model recommended some years ago for national-level Open Access collections¹⁴. It is also the one now adopted by the European Commission for its own-funded research: the Commission-funded OpenAIRE repository is harvesting European-funded works from institutional repositories across the European Union, and the Commission's policy requires those works to be deposited locally wherever there is a suitable institutional archive. Other national Open Access collections have also adopted this model¹⁵.

The advantages to this model are that institutions are already equipping themselves with repositories, so the basic infrastructure is already being put in place and, importantly, institutions can be partners to funding agencies in monitoring and policing mandatory policies (both their own and on behalf of funders). Indeed, evidence shows that so far, notwithstanding the much-improved compliance rate for the NIH public access policy, the highest rates of compliance with mandatory policies are still seen at universities that have such policies and conscientiously support and monitor them locally¹⁶.

(4) Are there models or new ideas for public-private partnerships that take advantage of existing publisher archives and encourage innovation in accessibility and interoperability, while ensuring long-term stewardship of the results of federally funded research?

Long-term stewardship of research outputs is undertaken by libraries and by publishers as well as specific preservation services that may be public or private concerns. University and research institution libraries have the relevant expertise to provide preservation and curation services at least into the medium term: the academic library community as a whole has the organisational wherewithal and capabilities to determine that policies and practices are put in place to ensure the safe keeping of scholarly material into the long term.

While there is always scope for encouraging public-private partnerships to create better services, the overall goal remains that access be free for both current and past literature. There are examples where public-private partnerships work to this end, such as in the case of UKPMC, the UK site for PubMed Central. This is funded by both public (UK research

¹⁴ Swan, A., Needham, P., Proberts, S., Muir, A., Oppenheim, C., O'Brien, A., Hardy, R. and Rowland, F. (2005) Delivery, Management and Access Model for E-prints and Open Access Journals within Further and Higher Education. Technical Report, JISC, HEFCE. <http://eprints.ecs.soton.ac.uk/11001/>

¹⁵ For example, Ireland, amongst others: <http://rian.ie/en/static/Aboutus>

¹⁶ Gargouri, Y., Hajjem, C., Lariviere, V., Gingras, Y., Brody, T., Carr, L. and Harnad, S. (2010) Self-Selected or Mandated, Open Access Increases Citation Impact for Higher Quality Research. *PLOS ONE*, 5 (10). e13636. <http://eprints.ecs.soton.ac.uk/18493/>

councils, the British Library) and private (medical charities) funders. All parties are committed to providing public access for the long-term, in the interests of the public, research and the missions of the sponsors.

Where legacy literature is in the hands of private publishers, as is the case for the publishers' archives of versions-of-record of journal articles, there is certainly room for consideration of how public access might be provided to that material. However, the most important thing is that policy ensures that this is not the *sole* means of preserving the literature since private publishers' interests are served by access restriction rather than access maximisation.

(5) What steps can be taken by Federal agencies, publishers, and/or scholarly and professional societies to encourage interoperable search, discovery, and analysis capacity across disciplines and archives? What are the minimum core metadata for scholarly publications that must be made available to the public to allow such capabilities? How should Federal agencies make certain that such minimum core metadata associated with peer-reviewed publications resulting from federally funded scientific research are publicly available to ensure that these publications can be easily found and linked to Federal science funding?

The research literature should be made available through OAI-PMH-compliant¹⁷ repositories or journal sites. The ideal is to have a metadata set that describes adequately the provenance and content of the article, and the funder and grant award information, so that searching for outputs of particular research programmes is enabled. For full interoperability, a machine-readable licence should also be part of this metadata set.

Federal agencies are highly likely to want to understand how the material whose production they have funded is used. To this end, attention should be paid to ensuring that the material is stored in repositories that can provide usage data. There are a number of initiatives and standards being developed that will enable usage data to be aggregated across repositories and, hopefully, across publisher sites too, though the latter is dependent upon publisher cooperation: a promising start in this direction in the form of the PIRUS project has successfully proved a concept but the follow-up will focus only on repositories unfortunately. Nonetheless, it is useful to be able to measure usage across repositories and federal agencies will benefit from this.

In terms of academic impact (citations) some nascent services that will work on the Open Access corpus are in development, and the recently formal launch of Google Scholar Citations means that there is now at least one useful alternative to inaccessible (commercial) services that works across the whole scholarly literature.

There is no doubt that further developments will occur in the area of technical interoperability but this will always be work-in-progress: the best options available now, and there are a number of good options, should be exploited now to bring forth public access, while a watching brief is kept upon new developments over time.

¹⁷ <http://www.openarchives.org/pmh/>

(6) How can Federal agencies that fund science maximize the benefit of public access policies to U.S. taxpayers, and their investment in the peer-reviewed literature, while minimizing burden and costs for stakeholders, including awardee institutions, scientists, publishers, Federal agencies, and libraries?

The benefit to all stakeholders who can use research findings is maximised by immediate, full, Open Access, delivered through a well-designed system which adheres to standards on technical interoperability, making the provisions and the finding and using of Open Access content as simple as possible and barrier-free.

The burden can be minimised by simplicity of policy and process. Policies across federal agencies should be coordinated – ideally, copied, but allowing for some minor differences where appropriate and really necessary – so that grant-holders, their institutions, libraries and publishers do not have to cope with a plethora of variations.

(7) Besides scholarly journal articles, should other types of peer-reviewed publications resulting from federally funded research, such as book chapters and conference proceedings, be covered by these public access policies?

Peer-reviewed journal articles are the primary target for public access policies: the material is supplied free of charge by the authors who have conducted the research using public funds. Conference proceedings are the main publication channel for certain disciplines, notably most fields of engineering, including computer science. Papers submitted for peer-reviewed conference proceedings are generally provided under the same conditions as those to journals – that is, they are provided free of charge by the authors. Where this is the case, and the work is publicly funded, the same conditions of access should pertain in policies.

Books are usually distinguished from the above because they are written with some expectation of royalty payment to the author. The public usefulness, and the fact that most books are written about research that is publicly funded, make this a more difficult case for policy development. At the moment, policy should encourage book content to be made accessible as soon as possible, and it should be noted that there is plenty of evidence now to indicate that such a process frequently drives up sales. Also, it looks likely that Open Access monograph publishing will continue to grow from its current small base to become a significant part of the book market, though business models that work for the long term have yet to be fully worked out. There are, however, some promising initiatives in this area and they signal better access to monograph content in the future¹⁸.

(8) What is the appropriate embargo period after publication before the public is granted free access to the full content of peer-reviewed scholarly publications resulting from federally funded research? Please describe the empirical basis for the recommended embargo period. Analyses that weigh public and private benefits and account for external market factors, such as competition, price changes, library budgets, and other factors, will be particularly useful. Are there evidence-based arguments that can be made that the delay period should be different for specific disciplines or types of publications?

¹⁸ See, for example: <http://www.youtube.com/watch?v=niyYVWa2w6w>

No embargo at all is the desirable goal for research papers. We have provided evidence above on the effect of delays in accessing research findings and we see no compelling reason for enshrining such detrimental effects in policy. The argument for embargoes is made by publishers on the basis that publishers must have time to collect revenues from subscriptions, yet a majority of publishers permit public access through institutional repositories to the author's final version of a journal article immediately after peer-review, indicating that it is perfectly possible to continue in business while permitting this practice. Indeed, there is still no evidence to conflict with the testimonies¹⁹ provided by the American Physical Society and the Institute of Physics Publishing (UK) in 2005, where both stated that no subscriptions losses can be attributed to the self-archiving of papers in the high energy physics Open Access repository, arXiv, despite the full contents of many journals having been made available through this route by authors since 1991.

Moreover, if publishers still fear a detrimental effect from lack of embargoes, they have a further option: there is now plenty of evidence that publishers can make a sound and sustainable business from flipping their business model to collect revenue in the form of article-processing charges and publish Open Access journals (which do not have an embargo). From independent start-ups through to bold 'flips' from the subscription model, publishers have demonstrated that Open Access publishing is a viable alternative to the subscription sales model.

The public benefit of immediate access to research findings is demonstrably high. Policies that accommodate embargoes reduce that public benefit in favour of a financial benefit to private concerns, one that can be derived anyway by a change of business model, leading to an outcome where the needs of all parties are satisfied.

This submission

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¹⁹ <http://users.ecs.soton.ac.uk/harnad/Hypermail/Amsci/4336.html>

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