

Open Access Publishing Considerations for the Deep-Ocean Science Community

Why pay high fees to publish your research? And is your work legally available to the people who need it?

Like many other scientific disciplines, published work in the field of deep-ocean science suffers from a lack of accessibility. Even though 80% of academic research is funded by the public or by charities, **most articles end up behind paywalls, unavailable to the scientists and practitioners who need them most** ([Piwowar et al. 2018](#)). This is a major issue, as deep-sea research often has important societal implications and should have widespread accessibility. Open access research, which makes digital content directly available online with user rights and terms of copyright clearly defined, avoids this problem, but at a cost: **Instead of the reader paying, it is the authors or their institutions/funders who may be forced to spend huge amounts of money to make their research available.** Large publishers make substantial profits in the process, while scholars review this research for free. **If our field is to improve, these related challenges of accessibility and cost need to be addressed.**

The scientific publishing landscape is complex. It can be a minefield trying to decide where to publish your cherished research. Early-career ocean professionals and established researchers alike are often guided by ingrained habits, cost, cultural practices and institutional agreements, but the landscape of academic publishing is changing. **It is time to equip ourselves with knowledge on this important issue.**

The DOSI Open Access Task Force was convened to investigate the challenges surrounding open access publishing in our field and to open discussion in our community. **That process has culminated in an online resource (see item 9) and in the following points developed for your consideration:**

1. **Most published scientific papers relating to life in the deep ocean over the past 10 years have been behind a paywall**, rendering them inaccessible to most of the public. However, according to the DOSI Open Access Task Force investigation of publishing habits (paper in prep) the field of deep-ocean ecology experienced a marked increase in open access publications between 2011 and 2020. While a positive development, this change has come at significant financial cost to researchers and/or the institutions and funders that support them.
2. **No science should be locked behind paywalls.** Researchers should be fully aware of the scientific limitations they may place on the equitable dissemination of their work if they report their outcomes in publications that will be locked behind paywalls (see [Plan S](#)). Major funders and governments across the world are signing up to PlanS (or alternative policies that similarly mandate immediate open access), which lays out commitments to making research fully and immediately open access upon publication or earlier (without embargoes). The fact that our scientific work may be inaccessible to many of our fellow scientists and other deep-sea stakeholders who would benefit from the knowledge is unethical. It is against the very nature of scientific endeavour if only a portion of the scientific community can access, discuss, challenge and, where appropriate, test and reproduce the works. Specific parts of our community such as Early-Career Ocean Professionals and researchers in lower and lower-middle-income countries suffer most in those cases.

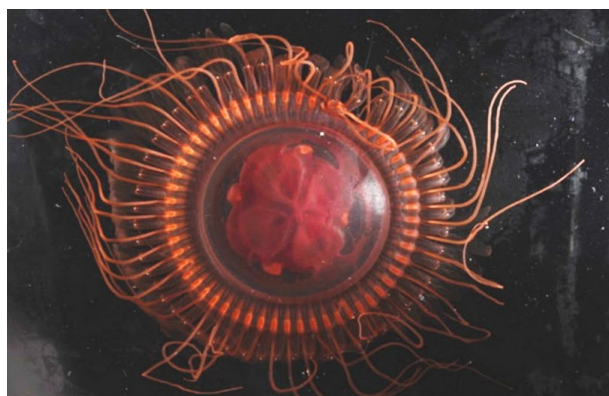
3. **There are low-cost and free options for open access publishing.** In addition to the most common “Gold” open access, where the author, institution, or research funder pays a fee to have a free version of a paper available to all online, “Green” open access makes the author version available. Many journals/publishers have ‘embargo’ policies that bar authors from uploading a version of their work to a not-for-profit repository (e.g. shareyourpaper.org or [Zenodo](https://zenodo.org)). Typically the embargo period is 6, 12 or 24 months, after which authors can upload a full-text version of their work to a repository providing global open access, albeit delayed. However, remarkably few authors actually do this. Of the deep-sea scholarship published from 2011-2020, a huge percentage could now be made open access if authors chose to take action. If you are affiliated to an institution with a repository, consider self-archiving your research outputs here too as this will enable long-term and secure access to your paper. Legal issues with publishing will likely be dealt with by your institution.

Diamond or Platinum open access allows immediate access to the content of a journal without a subscription fee or licence and with no article publication charge for the author. This ‘publisher-pays’ model is usually offered by university presses where the costs of publication are subsumed within existing budgets and regarded as part of the mission of a university. Bronze open access is where the publisher chooses to make a publication freely available to read with no charge to the author. Details of open access options can be found at [this resource from Open Access Australasia](#). Making files available to others directly by email and through [ResearchGate](#) is not open access, but is another way to promote your publications. There are also pre-print servers such as [BioRxiv](#), [EcoEvoRxiv](#) and [SciELO](#). Preprint servers link to the final paper once it is published. These are free for authors and can make a big difference in terms of accessibility. [Unpaywall](#) is an easy and legal way to find open copies of articles. You may also wish to review the [Directory of Open Access Journals \(DOAJ\)](#). More than 70% of open access journals do not have Article Processing Charges (APCs) so you may find a good free option for publishing. (see point 9 below).

4. **We as a scientific community have an ethical obligation NOT to pay exorbitant Article Processing Charges.** The large price difference between journals exists because some journals make more profit or spend more money on marketing or other expenses than others ([Van Noorden 2013](#)). There are good scholarly journals with reasonable APCs. Thus, is it ethical that we use money provided to us by taxpayers, private funders or our institutions to pay high APCs to some journals when there are good alternatives at lower costs or even (depending on subject area) free? Institutions generally demand multiple quotes to get best value for most purchases, but oddly not for publications. Consider shopping around and bearing in mind the cost of various publishing options. Also, be sure to check a journal's submission criteria for any APC waivers. If your institution encourages you to pursue journals with high prestige and often consequently high APCs, it may be useful to emphasise how valuable money saved from APCs can be for other purposes such as hiring student assistants. It should be noted that there are some journals, e.g. Antarctic Science Journal, that reinvest their profits from APCs in research. This investment in science may outweigh high APCs for some who can afford to donate in this way.
5. **Some free journals in which our community publishes have higher impact/influence than some expensive journals.** It may be assumed that paying high APCs to disseminate one’s work should result in greater article impact/influence. However, APCs are not necessarily driven by the costs associated with advertising published research. There are plenty of lower-cost publishing options that have a higher impact factor rating than many expensive journals. Publishing at a premium cost is not necessarily worthwhile. ([Maddi & Sapinho 2022](#); <http://www.eigenfactor.org/projects/openAccess/index.php>)
6. **The world is moving away from journal impact factors and other journal-level metrics.** The measurement of journal impact factors has a number of well-documented deficiencies as a tool for research assessment outlined here: <https://sfdora.org/read/>. There are alternative metrics to indicate impact such as article-level citations or altmetrics. Impact factors, while traditionally a measure of prestige, say nothing of the real-world impact that authors have achieved. It is also not necessarily the case that ‘higher-tier’ journals are somehow selecting the most robust research. Although challenging to accurately assess, the opposite may actually be more likely ([Brembs, 2018](#)). Some institutions such as Utrecht University in the Netherlands have formally abandoned the impact factor in all promotion and hiring decisions.

7. **Our community is collectively spending a large amount of money on Article Processing Charges.** Analysis of our combined deep-sea ecology and biodiversity research publishing habits over the past 10 years shows that while some of our habits have changed and more of our papers are now open access, we are collectively spending a large amount of money on APCs. The top 10 most popular journals for our publications in 2020 charged an amount between \$1,695 to \$4,359 per article or per 10 pages, with an average APC of \$2,813. It is important to note that direct cost comparisons between open access APCs and subscriptions paid by an institution / library to access articles / journals behind paywalls is not possible since the latter are not publicly disclosed, but these are estimated to range between \$4,000-5,000 per article ([Grossman and Brembs, 2019](#)). Future research should directly compare publishing costs for institutions between the two models.
8. **Established deep-sea experts can influence change.** When well-respected deep-sea colleagues publish in a particular journal, this can stimulate others to follow suit and establish a new publishing behaviour within the community. Such change should be directed toward journals with better access and/or lower costs.

9. **A new DOSI online resource can help you decide where to publish open access.** We have compiled a list of journals suitable for deep-sea research topics along with data around open access availability and charges. [That list can be found here.](#) We hope that the deep-sea community will use this resource to find open access and low-cost options for publishing work in our field. Please note that this resource does not intend to recommend specific journals or highlight their scientific quality in terms of reviewing processes, etc. This is a dynamic list which we intend to update through community liaison. For example, the current list does not reflect Green open access options and we encourage the addition of these options by the community. If you wish to add a journal to this list or update information for a journal that is already included, please [submit details through this Google form.](#)



(a)



(b)

Figure 2 from [Matsumoto et al. \(2022\)](#) showcasing a newly discovered deep-sea red medusa. Without open access, we could not have shared the above figure in this briefing. Brightness and contrast of the figure have been increased.

DOSI's Open Access Task Force will continue working to support open access publishing in our field. The UN Decade represents an opportunity to promote fair, free and easy access to deep-ocean science and policy documentation. There are a variety of programmes including [Challenger 150](#), [DOOS](#), [JETZON](#) and other UN Decade Actions and programmes that can benefit from this brief and from further discussion. One outcome of such discussions could be a deep-sea science code of conduct for publication. There will be opportunities for our community to get involved soon, so please stay tuned. If you would like to join the Open Access Task Force's efforts, we invite you to reach out to DOSIcomms@gmail.com.

There are many options for making research more accessible, including legal self-archiving, but lasting change will require the deep-sea research community to move away from journal-based evaluation criteria.

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How to Cite: DOSI (2022). "Open Access Publishing Considerations for the Deep-Ocean Science Community" Deep Ocean Stewardship Initiative Policy Brief. <https://www.dosi-project.org/wp-content/uploads/open-access-deep-community-briefing.pdf>

ABOUT DOSI

The Deep-Ocean Stewardship Initiative seeks to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction.



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Resources:

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Grossmann A. & Brembs B. (2019). Assessing the size of the affordability problem in scholarly publishing. *PeerJ Preprints* 7:e27809v1 <https://doi.org/10.7287/peerj.preprints.27809v1>

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Van Noorden, R. (2013). Open access: The true cost of science publishing. *Nature* 495, 426–429. <https://doi.org/10.1038/495426a>

Further reading:

European Commission, Directorate-General for Research and Innovation, [Monitoring the open access policy of Horizon 2020](#) : final report, Publications Office, 2021

<https://mitpress.mit.edu/books/open-access>

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