



Phycological Society Of America

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Office of Science and Technology Policy

To Whom It May Concern:

The Phycological Society of America (PSA) appreciates the opportunity to respond to OSTP's request for information from scientific societies about questions concerning public access to federally-funded research, as described in the Federal Register solicitation of 4 November 2011 per Section 103 (b)(6) of the America COMPETES Reauthorization Act of 2010 (ACRA). "Phycology" refers to the study of algae. The PSA is a non-profit scientific society that is incorporated in the State of Maryland and was founded in 1946 to advance research and education in all aspects of algal science. Our membership is comprised of about 1,000 scientists, researchers, educators, and graduate students who do research in universities, industry, state and federal government, and NGOs. About two-thirds of them work or study in the US. Our members study a remarkable range of important topics, from key aspects of global carbon cycles to important health issues. For example, one of our members found that the mosquito-transmitted malarial parasite contains an essential, relic chloroplast (the part of a cell that carries out photosynthesis), opening new targets for treatment of the disease because human cells do not contain chloroplasts.

The PSA's *Journal of Phycology* is entering its 48th year (2012) of publication of basic and applied research on algae and their roles in the ecosystem. For example, the *Journal of Phycology* recently published:

- Unequivocal demonstration that the skin-eating alga *Pfiesteria piscicida*, which kills marine fishes, is a typical (not unusual) dinoflagellate, making its management more straightforward,
- Discovery of an ancient lineage of green algae in barely lit areas of the ocean,
- The first genetic modification (transformation) of the chloroplast of diatoms, which are among the most abundant algae of freshwaters and oceans and account for 25% of photosynthesis on Earth, and
- Many papers dealing with lipid biosynthesis pathways in algae, a field of research critically important for algal biofuels' development (Note: petroleum is composed of ancient algae).

PSA owns copyright to current and full back issues of the print and electronic journal, which is published 6 times/year. PSA controls all editorial decisions and content of our journal, which has been published since 1999 in association with Blackwell and now Wiley-Blackwell Publishers, the publisher of the journals of about 258 other US scientific and scholarly societies. Our partnership with Wiley-Blackwell (W-B) was particularly valuable in terms of early establishment of the electronic version of the *Journal of Phycology* (begun in 1999), which provides easier and wider access to research published in our *Journal*, and enables archive of digital data and detailed methodological information

associated with papers as supplementary electronic material. We are in a profit-sharing contract with W-B in which each party makes about \$100,000/year after expenses. Our “profit” is immediately invested in programs to support other society activities that build US science infrastructure (see below).

We wish to offer a general framework that is important as background to our responses to some of the questions posed by OSTP.

In PSA’s judgment, OSTP’s questions confuse two different products: the result of federally funded scientific research and the peer-reviewed publication that results from funded research. Despite the low-success rates (high competition) now typical for federally-sponsored grant competitions, the research papers that result are still vastly improved before publication by peer review from scientists who are expert in that field. This means that highly rated journals (e.g., the *Journal of Phycology*) that offer expert review of research in a particular field ---and their sponsoring scientific societies---should be valued by the federal government. Peer review sometimes finds that the investigator needs to use different or additional statistical techniques to analyze the data; sometimes the investigator has failed to compare his/her data to important research previously published in that area that influences interpretation of the new results; sometimes the investigator needs to do an additional confirmatory experiment in order for the results to be accepted by the scientific community as strong evidence in support or refutation of a hypothesis. Only peer review can force this improvement in the paper, and peer review by members of scientific societies is a critical contribution to the value of the research.

Scientists submit an average of 310 manuscripts each year to The *Journal of Phycology*. About half of these are ultimately published, but virtually no manuscript is accepted when it is first submitted. Instead, minor to major revisions are suggested by peer reviewers, and re-review of the revised work is required before a decision on acceptance is made. The *Journal of Phycology*’s review structure includes scientists serving as Co-Editors (4 CEs), Associate Editors (16 AEs), the Editorial Board (24 scientists), and several hundred other peer scientists who respond to requests from CEs/AEs to review manuscripts each year. Only the Managing Co-Editor receives stipend support (about 3 months’ salary) and only the Assistant Editor (editorial assistant) receives a full salary; total editorial office costs are \$106,000/year. These before-profit, publication expenses are paid by the partnership between PSA and W-B, based on income from subscriptions and downloads of articles by libraries and individuals (authors are rarely charged for publication in the *Journal*).

We estimate that the manuscripts that are reviewed each year at the *Journal of Phycology* require 5,580 hours of peer reviewer time and 2,640 hours of Co-Editor/Associate Editor time. Our conservative estimate of the value of this donated time is \$252,550.

The donation of time by scientists to society journals is an honored tradition to assure excellence in the field and because it is understood that scientific societies use the modest income from their journals to build scientific infrastructure. In 2011, PSA invested about \$30,000 in support of graduate student research and education; about \$22,000 in support of symposia (e.g., environmental genomics, algae and human health) at our annual meeting; about \$6,000 in public outreach activities (e.g., to K-16 teachers) through our Committees and website (www.PSAalgae.org); about \$3,000 to support the free, public algal database AlgaeBase (www.algaebase.org); \$5,000 for transition expenses in our Editorial Office; \$11,000 in 8 awards for meritorious research and publication prizes to senior researchers and students; and about \$10,000 in administrative expenses (e.g., accounting fees, travel by Society officers to a mid-year business meeting). PSA also “seeds” and co-publishes key

books in our field, including most recently *Algal Culturing Techniques* (2008), extensively used by researchers involved in experimental and commercial-scale grow-out of algae (e.g., for biofuels, food products, cosmetics) and *A Color Atlas of Photosynthetic Euglenoids* (2010), making it possible to identify algae that include biomonitors for eutrophication.

Question 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?

As stated above, the PSA (and similar scientific societies) holds copyright of the peer-reviewed articles in its journal. Thus, we do not think the federal government has a role to play in developing and expanding markets for scientific journals. With respect to access to publications needed to support economic growth, the partnership between PSA and Wiley-Blackwell Publishers already results in articles in the *Journal of Phycology* (and similar journals) being readily available upon publication:

- 1) Abstracts to articles are freely available in the Wiley Online Library (and retrievable freely by searches using search engines such as Google); interested parties who are not associated with a subscribing university library can buy single copies of any article that appears important to them for \$30/each.
- 2) Individuals exploring commercial developments based upon algal research can become members of PSA and enjoy full *Journal* access (1965-2012) for \$80/year (electronic subscription rate).
- 3) Most US researchers will have free access to the *Journal* through the consortial journals' package sold to university/college libraries by W-B.

We have found our partners at Wiley-Blackwell to be innovative and aggressive in marketing of the *Journal of Phycology* to increase its availability while using W-B funding to scan issues printed as paper only (1965-1998) in order that the *Journal* is available to interested parties in electronic form. The PSA retains full copyright and ownership of the pre-1999 *Journal*, including the new electronic files. W-B also continually develops, and makes available to our editors, software that helps us manage the peer review system more efficiently and cost-effectively.

We do think there is a role for the federal government in “eternal archive” research. Paper is still the only truly archival medium. Various schemes of networked comparisons of electronic publications are being used, but many societies are considering electronic-only publication in the near future to reduce production costs and, therefore, subscription costs to both libraries and individual members. It does not seem to us that there is a really secure, permanent archive for electronic publications. The government might sponsor research to pioneer such developments.

Question 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?

The best way to protect these intellectual property interests is to respect the copyright laws of the US. The key difference between “federally funded scientific research” and “peer-reviewed scholarly publications” must be understood by OSTP and Congress. Under no circumstances should the government jeopardize the value that peer review adds to the validity of scientific research, and the value and cost of this peer review should not be underestimated or ignored.

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

Publishers such as W-B have developed Digital Object Identifier (DOI) tags for each journal article over the last decade, and CrossRef already maintains more than 50 million DOIs. CrossRef is a not-for-profit group established by publishers including Wiley in 2002, and this private enterprise-supported development provides a great degree of interoperability. CrossRef allows a reader to link from a reference in the bibliography of an article in one journal to the full text of referenced articles in other journals, including those published by other publishers.

We can not imagine the US government purporting to have the right or the capacity to take custody of all published (copyrighted) content.

Question 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?

In discussing this question with our partners at Wiley-Blackwell, they told us about an important possibility in this regard, which would make it possible for funding agencies to be able to track all publications from each funded grant—and allow government funders to make a catalogue of this citation information for each grant available on agency websites. This would require that each journal article has metadata indicating the agency, agency division etc. that funded the paper. We understand that there is a good chance this feature may launch in 2012, because it has been endorsed by CrossRef and major science publishing trade associations with technical details now to be discussed between CrossRef, publishers, and agency representatives. This development would support accessibility and interoperability, and we urge the federal government to pursue its launch. It has the advantage of giving the public access to the various places in which peer-reviewed publications of the raw research results of each grant have been published.

The government could also develop a system that would link free research reports (funded grant abstracts or required final reports) from investigators on agency websites to the free abstracts of the final Version of Record of publications related to a particular grant.

Question 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 publically available and can be easily found and linked to Federal science funding?

Please see answer to Q4.

Question 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?

As pointed out above, tax payers have not paid for peer review, which adds strong value and validity to published research. Peer review has a cost. If the government wants to support the peer review system for federally-funded research, it could add suitable monies to each research grant to do so; most journals, including PSA's, have a mechanism to allow immediate free access to the entire published article if the authors pay a surcharge to cover costs of publication and (donated) peer review. In the case of the *Journal of Phycology*, authors' payments would allow us to reduce or eliminate subscriber fees if most authors paid for immediate open access.

Question 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?

No. These materials also benefit from peer review (book chapters or collections of full research papers from conferences) and are copyrighted.

Question 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?

In terms of the general issue of "shelf life" of research published in the *Journal of Phycology*, the ISI calculated "half-life" is greater than 10 years (and *J. Phycol.* has a 5-year Impact Factor of 2.86). This is an indication that our copyrighted product retains value for many years, due to the importance of the articles and the underlying excellence of peer review that helped make them important. This is one of the reasons that the PSA's partnership with W-B has been successful, because

W-B's early investment in electronic access for the pre-1999 *Journal of Phycology* opened wider access to the older literature published in the *Journal*.

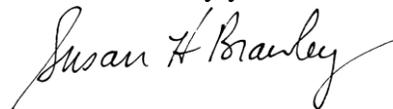
We will begin making 15% of our articles (the "Editors' Choices") open access in 2012; in part, this is an experiment to evaluate the effect on library subscriptions. Certainly, in order for the entire *Journal* to become open access, authors would have to pay the true cost of publication to replace income now derived from library and individual subscriptions and paid downloads of articles. The *Journal of Phycology* is a highly respected steward of much of the best research in algal science, but we are concerned that there would be substantial loss of library subscriptions if we made the full content of articles free soon after publication. What is "soon"? We are unsure, and must be cautious to avoid undermining our *Journal*, the focus and network of researchers it brings to research on algae, and the small income it provides to support PSA activities that support algal science.

It is important for researchers to continue to choose where they submit their research based on where they think it will have the best audience and where their manuscript will receive the strongest improvement in peer review, regardless of the ultimate decision on its acceptance or rejection for publication. This competitive system strengthens the scientific enterprise.

In summary, peer review provides a critical value-added benefit to the federally funded research on algae that is published in our journal, and *Journal of Phycology* content is therefore protected by copyright. We also believe, as documented above, that our content is widely available and that the free online abstracts allow interested parties to obtain full content important to economic development at very low cost.

These responses were reviewed by the PSA's Executive Committee. We would be happy to respond to further questions.

Sincerely yours,

A handwritten signature in cursive script that reads "Susan H. Brawley". The signature is written in black ink and is positioned below the typed name.

Susan H. Brawley
President