

SCHOLARLY COMMUNICATION IN THE MARINE AND AQUATIC SCIENCES

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Abstract: We initiated an evaluation of the scholarly communication and publishing process in marine and aquatic sciences. This involves three components: describing the core journals for the discipline; examining the mechanics of publishing; and learning the mindset of authors and editors. We identified a core list of 19 journal titles and examined their pricing history. We engaged in a dialog with editorial board members of marine and aquatic science journals. Finally, we initiated discussions with faculty to learn the role of publications in the promotion and tenure process. Once our evaluation is complete we hope that it will encourage the transformation of scholarly publishing in marine and aquatic sciences.

Introduction:

Library budgets rarely increase at the rate that journal costs inflate. This strains our budgets and exercises our creativity. We all want to maintain viable collections that support our researchers and students. Core lists are drawn up, hands wrung over the price of some of the titles, and we devise new ways to tell senior faculty that we cannot afford their favorite journal anymore. IAMSILC librarians have shared strategies to identify which journals to cancel and which to keep (Wible 1990; Wiest 1998; Williams 1990). Ultimately, librarians experience a great deal of frustration over the seemingly endless cycle of price increases and journal cancellations.

During the 2000 IAMSLIC conference in Victoria, Carla Stoffel explained the Tempe Principals (www.arl.org/scomm/tempe.html) as well as the SPARC Initiative (Scholarly Publishing & Academic Resources Coalition; www.arl.org/sparc). The SPARC initiative has recently celebrated two successes. Its alternative journal "Organic Letters" has surpassed the commercial equivalent "Tetrahedron Letters" in the ISI impact factor rankings. And, SPARC has received the "Service to Not-For-Profit Publishing Award" from the Association for Learned and Professional Society Publishers. Ms. Stoffel encouraged each of us to talk with our customers and work creatively on ways to keep information flowing and prices controlled. We feel this discussion should take place among the entire science community including authors, editors, publishers and librarians.

In the wake of recent journal cancellations, our two institutions (Oregon State University and University of Oregon) took Ms. Stoffel's advice seriously and set out to enlighten faculty about the scholarly publishing process, starting with those involved in the editorial process. Our provosts asked all editorial board members to identify themselves and discussions with these faculty members are underway. In addition, our respective University Librarians encouraged the two of us to consider proposing a new SPARC produced journal in the field of marine science.

Before embarking on this endeavor, we needed to know more about trends in marine and aquatic sciences publishing. The first step was to describe the nature of a "core" collection for marine and aquatic libraries. Next, we measured fluctuations in journal prices and examined other costs associated with journal production. Finally, we have begun to examine the mechanics of the publishing process, the mindset of authors and editors, and are learning about the promotion and tenure process that drives scientific publication.

Describing the Marine and Aquatic Science Field:

The first problem is defining the field of marine and aquatic science, and its journals. The wide variety of IAMSLIC libraries suggests that the field is indeed multi-faceted (Williams 1990). For example, the shift to molecular and genetic research in many of our labs during the past decade has changed the nature of some library collections. There are also traditional differences among our collections. The Guin Library collection has a strong focus on marine fisheries and aquaculture as well as a bias towards work on the Northeast Pacific, but the core oceanography journals are kept on the main campus where the oceanographic modelers are stationed. The Oregon Institute of Marine Biology, on the other hand, has a smaller collection appropriate for a teaching field station and highly reflective of local faculty interests.

We compiled a core list of publications from data published in IAMSLIC Proceedings and other sources since the mid 1980s (Fuseler 1989, Fuseler 1990, Norton 1985, Sieburth 1991, Wiest 1998, Williams 1990). A second list of journals was compiled using the journals with the highest ISI Impact Factors in the categories of Freshwater and

Marine Science (1995/2000), Oceanography (2000), and Fisheries (2000). The two lists were merged and the 19 titles appearing in both lists are the focus of this preliminary study (Table 1.)

Data from a 1996 Scripps Institution of Oceanography study on journal page costs (<http://scilib.ucsd.edu/sio/guide/prices/index.html>) was updated with the 2000 subscription prices paid by University of Oregon. We compared journal subscription rates and calculated the percentage change they have undergone during the past five years (Table 2). We also calculated the percentage change in cost-per-page over that five year period (Table 3).

Journal production and pricing can be very confusing. It may be difficult to distinguish a commercial journal from a society-based journal. Allen Press is a publishing house that produces many society journals. They provide a market analysis and price recommendation that is generally approved at society business meetings (Breithaupt 1995). According to some studies, 60%-70% of journal production costs are incurred before the physical production begins (Stankus 1999). It is difficult to understand why commercial (for-profit) journals are so much more expensive than society-supported journals. Author page charges by society journals appear to allow for lower subscription prices. However, some would argue that commercial prices remain artificially high because of a "third party" payment system. The publisher produces the journal, the researchers want access, but a "third-party", the library, pays the bill (Stoller, et al. 1996).

Observations:

- Many journal prices, but not all, inflate at a higher-than-normal rate. The American Institute for Economic Research (www.aier.org) shows an inflation rate of approximately 12.5% between the years of 1996 and 2000. Our calculations show that 14 of the 19 core journals increased at substantially higher rates.
- Subscription costs, particularly increases, are the first thing we notice about journal prices. However, cost per page seems to be a more accurate way to gauge the true cost of a journal. The \$250 journal may be as expensive as the \$2500 journal if you look at the number of pages you get for your money. Factor in color, and the \$2500 may look like a real bargain. Only 10 of the 19 journals showed substantial page cost increases. Six rose less than 12.5% and two fell considerably.

Our next steps:

- Examine a larger list of core titles.
- Evaluate copyright charges.
- Evaluate relationship between page charges to authors and subscription prices to libraries.

The Mechanics of the Publishing Process:

Now that we have identified a core list of journals, we are contacting editorial board members from these and other journals. We do not always contact the editor-in-chief but

will contact the individual we think most likely to respond to our request for an interview. The "Declaring Independence" (www.arl.org/sparc/DI) brochure gives the framework for our interviews with editors. "Declaring Independence" is a very thorough survey, but because it is so lengthy we are limiting our interviews to seven key questions (Appendix A.)

None of the editorial board members surveyed are involved in setting the price for their journal with the exception of one society-based journal where the editor is a member of the society executive board. Some receive honoraria or token monetary support from their publisher but generally used the money to cover administrative support costs. There is no concern that publishers made undue profit from a particular journal and only two respondents feel the need for a non-commercial alternative journal in the marine science field. One editor recently attended a presentation on the BioOne and SPARC. Two other editors have a limited knowledge of the BioOne and SPARC initiatives. None of the interviewees report a bias for or against societal or commercial publications in terms of value for promotion and tenure. The most frequently voiced concern is the time it takes for articles to be published in society journals.

We evaluated each journal to see if it had a clear copyright transfer statement limited to the print publication and its electronic analog and that did not limit the author's right to post the work on the Web. This was generally not the case and was not always easy to identify. Another aspect to copyright is the ability of a faculty member to use a copyrighted work as assigned reading for a class. Editorial board members were not always aware of these restrictions.

When asked if being an editor was rewarding, we received a range of replies. Dr. James T. Carlton, editor of *Biological Invasions* describes editorship as "A vast black hole of nothingness" simply because of the enormous workload involved. A former regional editor for *Marine Biology* says, "I just realized how much of my life I gave them for free". Other respondents provide a contrasting view. Jennifer Nielsen, editor of *Reviews in Fish Biology and Fisheries* offers: "*Editing a world-class international journal on fish and fisheries is a highly creative outlet for me. The challenges to understanding the broader, global issues in fisheries were never fulfilled by work or publication in local, i.e. North American, journal outlets. This job forces me to take a broader view of the issues and focus attention in areas I feel are neglected by other geo-centric journals. The rewards are found in the synthesis of ideas and people*".

Observations:

- We need to do more to inform authors and editors about alternative publishing efforts.
- We need to learn more about the commercial publishing industry and what it takes to be able to publish a high quality journal in a timely manner.
- We need to help authors understand the consequences of assigning their copyright to the publisher.

- Our next steps:
- Examine copyright statements more thoroughly.
- Interview additional editors.
- Investigate the role of BioOne.
- Investigate the costs of publishing and identify a range of acceptable profit.

Faculty Mindset:

To understand the faculty perspectives of the scholarly publishing process, we developed a set of questions to ask faculty involved in promotion and tenure decisions (Appendix B.) Discussions with faculty have been informal, yet focus on the importance of publications in the review process, and their perception of the most prestigious journals in their field. Few seemed concerned with the basic concept of promotion and tenure or the reliance on prestigious journals in their careers.

One researcher takes a stand:

Several years ago an untenured faculty member at University of Southern California began to take issue with the very high cost of Marine Biology (\$1900/year during the time of these discussions, \$3880 and \$1.70/page today.) Upon reviewing an article for this journal he informed the editorial board he had spent five hours in review, his time was worth at least \$20 per hour and would they please reduce his library's subscription to *Marine Biology* by \$100. The editorial staff did not agree and several heated letters were exchanged. The faculty member decided he would no longer publish in anything except non-commercial journals such as *Development*, *Invertebrate Biology*, and *Biological Bulletin*. He continues to advise students against publishing in commercial journals saying that to do so "steals money from your library." In two cases, his students felt the need to publish research in high profile journals so the researcher is a co-author in those commercial publications. Taking a stand against commercial publishers did not adversely affect this researcher. He was awarded promotion and tenure and has never been without grant support.

Is this an isolated case? If more researchers took this approach would we see a change in commercial journal pricing?

Observations:

- Publications figure quite prominently in promotion/tenure evaluations because this is the concrete evidence that research has been completed and disseminated.
- The quality of the publications matters, not the quantity
- Faculty have little understanding of the difference between commercial and non-commercial journals. In the case of society-based journals this can be complex because commercial publishers produce some as well.
- Timeliness of publication is the main reason that researchers choose commercial journals over societal journals for their publications.

Our next steps:

- Interview additional faculty.
- Compare faculty perceptions of valued titles with our core journal lists.

The future:

Does this work alleviate our frustrations over journal pricing and possibly more cancellations? Does it answer our administrator's question of promoting a new journal? No, rather it does begin to involve us in our community of science. By including authors, editors and publishers in this discussion that has traditionally been limited to librarians we may help to transform the scholarly publishing process.

Appendix A:
Questions asked of editorial board members

1. Do you as editors help establish the price of your journal?
2. Have you noticed any changes in subscribership during the past 10 years and could those changes be associated with the cost of the journal?
3. Do you know the amount of profit your publisher makes from your particular journal and do you believe this amount is fair?
4. What sort of assistance do you receive from the publisher and are these services valuable enough to warrant the price differences seen between commercial and societal journals?
5. As researchers in your field, you are probably called upon to review the research of colleagues (whether publications, grant proposals for promotion request). Do you notice if researchers publish in society (not-for-profit) vs. commercial (for-profit-journals and do you have an opinion about the value of either type of publication?
6. Are you familiar with initiatives such as SPARC and BioOne and do you see a need for a non-commercial journal in the marine and aquatic sciences?
7. Does your publisher ever allow authors the right to maintain an electronic archive of their own articles for use when teaching or must they pay copyright royalties when using their own work for classroom reading?

Editorial board respondents:

- *Advances in Marine Biology* (Craig Young, editorial board)
- *Aquatic Microbial Ecology* (John Dolan, Deputy Managing Ed.)
- *Biological Bulletin* (Richard Emlet, editorial board)
- *Biological Invasions* (James Carlton, Editor)
- *Estuarine Coastal and Shelf Science* (Stephen Sulkin, Regional Editor)
- *Invertebrate Biology* (Vicky Pearse, Editor)
- *Journal of Experimental Marine Biology and Ecology* (Anthony Underwood, Managing Editor)
- *Journal of Physical Oceanography* (Lynne Talley, Editor)
- *Marine Biology* (Otto Kinne, Editor-in-Chief)
- *Marine Ecology Progress Series* (Otto Kinne, Editor)
- *Reviews in Fish Biology and Fisheries* (Janet Nielsen, Editor)

Appendix B

Questions for Researchers Regarding Promotion and Tenure

1. How are you involved in the promotion and tenure process? (serve on a departmental committee, help others prepare dossiers, etc.)
2. What is the importance of publications in the promotion and tenure process?
3. Is publication in a non-profit journal a detriment to promotion and tenure? Examples of a non-profit journal are those published by the Ecological Society of America or the American Fisheries society.
4. Besides *Science* and *Nature*, what do you consider the three most prestigious journals in your field?
5. What do you consider the next tier of journals?
6. What value do you place on regional journals or those that address a sub-discipline? Examples are *Northwest Science* and *Journal of Aquatic Animal Health*.
7. Where do you encourage your graduate students to publish?
8. Any other comments?

Faculty respondents

- Dr. Richard Emlet (University of Oregon)
- Dr. Dan Edge (Oregon State University)
- Dr. Charles Miller (Oregon State University)
- Dr. Robert Olson (Oregon State University)
- Dr. William Percy (Oregon State University)
- Dr. Bruno Pernet (University of Oregon)
- Dr. Gil Sylvia (Oregon State University)

Table 1: Core Titles in Marine and Aquatic Science

Journal Title	Norton 1984	Fuseler 1989	Williams 1989	Fuseler 1990	Sieburth 1991	ISI 1995	Wiest 1998	ISI 2000
<i>Advances in Marine Biology</i>		•				•		•
<i>Canadian J. of Fisheries & Aquatic Sciences</i>		•	•		•	•		•
<i>Deep-Sea Research I & II</i>	•		•	•				•
<i>Estuarine Coastal & Shelf Science</i>		•	•	•	•	•		•
<i>ICES J. of Marine Science</i>		•				•		•
<i>J. of Experimental Marine Biology & Ecology</i>		•	•		•	•	•	•
<i>J. of Fish Biology</i>		•				•		•
<i>J. of Marine Research</i>				•	•			•
<i>J. of Phycology</i>					•	•		•
<i>J. of Physical Oceanography</i>			•	•				•
<i>J. of Plankton Research</i>		•	•		•	•		•
<i>Limnology & Oceanography</i>		•	•	•	•			•
<i>Marine & Freshwater Research</i>		•	•	•				•
<i>Marine Biology</i>	•	•	•		•	•	•	•
<i>Marine Chemistry</i>			•	•	•		•	•
<i>Marine Ecology Progress Series</i>		•	•	•	•	•	•	•
<i>Marine Environmental Research</i>		•	•		•	•		•
<i>Oceanography & Marine Biology: annual review</i>		•		•		•		
<i>Progress in Oceanography</i>				•				•

Notes:

ISI 1995 reflects data from the ISI Impact Factors for Marine and Freshwater.

ISI 2000 reflects data from the ISI Impact Factors for Marine and Freshwater, Oceanography and Fisheries.

Other data is from papers presented to various IAMSLIC conferences.

Table 2: Subscription Cost Comparison of Core Titles: 1996 to 2000

Journal Title	Publisher	1996	2000	% change from 1996 to 2000
<i>Advances in Marine Biology</i>	Academic	\$71	\$123	73%
<i>Canadian J. of Fisheries & Aquatic Sciences</i>	NRC	\$441	\$658	49%
<i>Deep-Sea Research I & II</i>	Pergamon	\$2801	\$3205	14%
<i>Estuarine Coastal & Shelf Science</i>	Academic	\$847	\$1821	115%
<i>ICES J. of Marine Science</i>	Academic	\$373	\$596	60%
<i>J. of Experimental Marine Biology & Ecology</i>	Elsevier	\$2572	\$3213	25%
<i>J. of Fish Biology</i>	Academic	\$1070	\$1614	51%
<i>J. of Marine Research</i>	Yale	\$105	\$125	19%
<i>J. of Phycology</i>	Blackwell	\$289	\$366	27%
<i>J. of Physical Oceanography</i>	AMS	\$304	\$442	45%
<i>J. of Plankton Research</i>	Oxford	\$400	\$560	40%
<i>Limnology & Oceanography</i>	Allen Press	\$184	\$372	102%
<i>Marine & Freshwater Research</i>	CSIRO	\$288	\$527	83%
<i>Marine Biology</i>	Springer	\$3316	\$3882	17%
<i>Marine Chemistry</i>	Elsevier	\$1153	\$1565	36%
<i>Marine Ecology Progress Series</i>	Inter-Research	\$3667	\$2867	-22%
<i>Marine Environmental Research</i>	Elsevier	\$787	\$1143	45%
<i>Oceanography & Marine Biology: annual review</i>	Taylor & Francis	\$157	\$180	15%
<i>Progress in Oceanography</i>	Elsevier	\$891	\$1624	82%

Note:

Subscription costs are primarily from University of Oregon. If not subscribed to, the information is from Oregon State University. The costs include any vendor charges and reflect actual invoices.

Table 3: Cost per Page Comparison of Core Titles: 1996 to 2000

Journal Title	Publisher	1996	2000	% change from 1996 to 2000
<i>Advances in Marine Biology</i>	Academic	\$.18	\$.48	172%
<i>Canadian J. of Fisheries & Aquatic Sciences</i>	NRC	\$.20	\$.26	32%
<i>Deep-Sea Research I & II</i>	Pergamon	\$.72	\$.54	-26%
<i>Estuarine Coastal & Shelf Science</i>	Academic	\$.52	\$ 1.06	104%
<i>ICES J. of Marine Science</i>	Academic	\$.30	\$.32	4%
<i>J. of Experimental Marine Biology & Ecology</i>	Elsevier	\$.70	\$.79	12%
<i>J. of Fish Biology</i>	Academic	\$.80	\$ 1.00	25%
<i>J. of Marine Research</i>	Yale	\$.09	\$.12	41%
<i>J. of Phycology</i>	Blackwell	\$.26	\$.31	17%
<i>J. of Physical Oceanography</i>	AMS	\$.22	\$.14	22%
<i>J. of Plankton Research</i>	Oxford	\$.17	\$.23	41%
<i>Limnology & Oceanography</i>	Allen Press	\$.10	\$.20	98%
<i>Marine & Freshwater Research</i>	CSIRO	\$.28	\$.63	131%
<i>Marine Biology</i>	Springer	\$ 1.50	\$ 1.70	13%
<i>Marine Chemistry</i>	Elsevier	\$.83	\$.92	11%
<i>Marine Ecology Progress Series</i>	Inter-Research	\$.74	\$.58	-22%
<i>Marine Environmental Research</i>	Elsevier	\$ 1.01	\$ 1.09	9%
<i>Oceanography & Marine Biology: annual review</i>	Taylor & Francis	\$.27	\$.41	50%
<i>Progress in Oceanography</i>	Elsevier	\$ 1.20	\$ 1.20	0%

Note:

Subscription costs are from Table 2. The page counts are from the 1996 Scripps study with 2000 data and other missing data compiled from the Oregon State University collection.

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