

Two societies show how to profit by providing free access

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ABSTRACT: Authors and their sponsors are beginning to realize that immediate free Web access (IFWA) provides the most convenient access to journal articles thereby maximizing their impact. Furthermore, IFWA is the most economical mode of access, and, no matter what the mode, authors and their sponsors pay nearly all the costs of access. Because those who pay for access to journal articles consider IFWA both best and cheapest, IFWA will soon replace other modes of access. Journal publishers who wish to stay in business should start offering their authors IFWA at a fair price. Two entomological societies have done so and profited.

Introduction

Authors of journal articles seek “impact” rather than royalties. They want their research results to gain the attention of the widest possible audience in hope that their scholarly efforts will be used and cited by others. They know that job offers, tenure, promotions, and merit pay increases depend in part on the attention their refereed articles receive. They also know that this attention depends significantly on how conveniently their articles can be accessed. And they know that the most convenient access must comply with these three criteria: (1) Web-based (as opposed to requiring a trip to a research library), (2) no barriers (as opposed to requiring that readers pay a fee or prove they belong to an institution with a site license), and (3) unimpeded access concurrent with publication (as opposed to unimpeded access after a delay of six months or more). In other words, authors want everyone to have immediate, free, Web access (IFWA) to their articles.

IFWA may be what authors want, but is it affordable? To answer this question, consider the principal means of providing access to journal articles and compare their costs:

- traditional (paper issues in libraries): the only means available for about 330 years.
Expensive!
- parallel (traditional plus electronic): the current means. Very expensive!
- electronic only, with restricted access: a means that some publishers expect to prevail.
Inexpensive.
- electronic only, with free access: the means that authors and their sponsors want to prevail. Very inexpensive.

As shown by Andrew Odlyzko, in traditional access about two-thirds of the costs are for library operations and only about one third is for revenues paid to publishers (including costs of subscriptions). In absolute terms, he estimated that the average article created \$8,000 in library operating costs and \$4,000 in revenues for the publisher¹. Thus the last two principal means of access are much less expensive than the first two, because libraries need no longer provide access to paper copies². Of the last two means, free electronic access is substantially less expensive than restricted electronic access, because the costs of implementing restrictions are avoided.

No matter what the means, those who pay nearly all the costs of access are the same—namely, the authors and their sponsors. Thus if authors and their sponsors want IFWA (and they do) and if IFWA is the cheapest way to provide access (and it is), it seems safe to predict that IFWA will become the universal means of providing access to journal articles. And it seems logical that journal publishers who wish to survive the transition should start providing IFWA to their clients in fiscally responsible ways.

In this article I will describe how two entomological societies have profited by doing so.

Florida Entomological Society: 100% IFWA since 1994.

The Florida Entomological Society (FES) has 450 members and publishes a single journal quarterly. Its annual publishing costs are about \$55,000. Its paid staff consists of a part-time business manager and a part-time editor. FES's journal, *Florida Entomologist* ranks in the top half of the 66 entomology journals evaluated by the Institute of Scientific Information, with an average rank of 30 for the three principal rankings assigned³.

In 1993, the FES Executive Committee endorsed a statement that journals should be accessible on the Internet and that access should be free, just as it is to paper copies in research libraries. I was instructed to work with the printer to test this notion. After 18 months, we settled on a means for making *Florida Entomologist* articles freely accessible on the Internet. In November 1994, the month that Adobe made its Acrobat Reader cost free, *Florida Entomologist* became the first long-published, refereed, natural science journal to make its contents freely available on the Internet and the first journal to use PDF format for that purpose. The Florida Center for Library Automation hosted the files for free so *the cost to FES of the online version was only the cost of making the PDF files*. The FES Executive Committee voted to continue providing IFWA to all articles and saw no immediate need to charge for the service.

Table 1 summarizes how FES continually improved electronic access to *Florida Entomologist*. In 1996, FES added bare-bones HTML files to enable robots from Web search services to index every word and phrase in every article. The target search service at the time was *AltaVista*; it is currently *Google*. In 1997, authors were given the option of paying to have additional information archived with and linked to the e-version of their articles. In 1998, FES implemented full-text searching of all articles in the online version of *Florida Entomologist*. In 1999 FES completed a project to make freely available on the Web all *Florida Entomologist* articles not previously posted. This was done at a cost of less than 60 cents per page. In 2002, Institute of Scientific Information (ISI) agreed to implement links from its online databases to the

full text of *Florida Entomologist* articles. This is noteworthy because ISI produces some of the most highly used online indexes to the journal literature. Researchers use its *Current Contents* more than any other service to learn of journal articles soon after publication. Thus, in the future, when researchers learn of a *Florida Entomologist* article via *Current Contents*, they will be able to access the full text with the click of a mouse.

Through 2000, FES continued its policy of not charging authors for IFWA. This was justified because costs were low and revenues from institutional subscriptions were nearly stable. In fact, in inflation-adjusted dollars, revenues from institutional subscriptions were 2% higher in 2000 than they had been in 1994 (Fig. 1). Subscriptions were down 5%, but this was countered by a 25% increase in the price of subscriptions in 1999. Interestingly, the 5% loss in subscription numbers was low compared to the experiences of other publishers (e.g., Fig. 2).

However, in Dec. 2000, FES's business manager reported to the Executive Committee that librarians had finally discovered that *Florida Entomologist* was freely accessible on the Web and few were renewing their subscriptions for 2001. I had long been ready for this event and recommended that FES start selling IFWA to those authors who were willing to pay for it. So long as *Florida Entomologist* was not 100% IFWA, most libraries should continue to subscribe. The rest of my proposal was that a year after publication, FES would provide free access to all articles. The Executive Committee did not follow my advice. Instead they voted to impose an IFWA fee on all authors. Not only that, they voted to start the fees with the March 2001 issue. Thus when the proofs for the March issue went to authors, an announcement of the new fees went with them. Although I expected vehement protests, no author complained about the injustice of imposing a fee that was not in effect (or contemplated) when their articles were submitted and later accepted. Their meekness was perhaps a symptom that in most cases their sponsors were paying publication costs.

As can be seen from Fig. 1, the predicted drastic decline in institutional subscriptions did not occur. In fact, the decline was only 6%. The result was a surge in publishing net income. In 2001, IFWA fees brought in \$10,800, yet FES had provided its authors nothing that it had not provided the year before. For the first time, IFWA costs could be deducted from IFWA income-- previously there had been no IFWA income. The e-version of *Florida Entomologist* costs FES \$3.15 per page (\$1.50 for PDF files and \$1.65 for HTML files). For the 751 pages published in 2001, the total cost was \$2,366, leaving a net income from IFWA of \$8,434.

Most gratifying was that if 100% of the 185 institutional subscriptions to *Florida Entomologist* in effect in 1994 had been lost, the net income from IFWA fees in 2001 would have been more than enough to compensate. The price of an institutional subscription in 2001 was \$50 and the net income from each subscription was about \$45. Thus the potential net income from institutional subscriptions was $185 \times \$45$ or about \$8,300. The net income from IFWA fees in 2001 exceeded this amount!

Since only 20 institutional subscriptions had actually been lost since 1994, only \$900 was needed to compensate. IFWA fees brought in more than \$7,500 in excess of this amount. It might be thought that the new fees would result in fewer submissions. This has not been the case. The 2001 volume was the largest on record, and the March 2002 issue is the first issue to exceed 300 pages.

If you wonder why FES has had such an easy time maintaining both 100% IFWA and a healthy balance sheet, I would point first to its low overhead and second to its avoiding the expenses of restricted access and elaborate HTML.

Now let's look at a society with higher overhead—one with a fulltime staff of about 15.

Entomological Society of America: currently ca. 55% IFWA

The Entomological Society of America (ESA) has 5700 members and publishes four journals bimonthly: *Journal of Economic Entomology*, *Environmental Entomology*, *Annals of the Entomological Society of America*, and *Journal of Medical Entomology*. Each of these journals is in the top 25% of the 66 entomological journals evaluated by ISI³. The annual publishing costs for these journals are about \$700,000.

Unlike the Florida Entomological Society, ESA long resisted experimenting with IFWA (Table 2). In 1995, on the recommendation of an e-publication committee of which I was a member, the ESA Governing Board voted to allow authors the option of buying IFWA for their articles. ESA's professional management did not implement IFWA sales. In 1996, the Governing Board reaffirmed its approval, but again there was no implementation. In 1997, against the advice of a new e-publication committee, the Governing Board cancelled its approval of IFWA sales. In 1998, professional management was instrumental in the Governing Board approving the posting of restricted-access electronic versions of ESA's four journals. The Governing Board was concerned about the cost of the restricted-access electronic versions and whether they would be profitable. In the minutes of the meeting in which the Governing Board gave its approval, the costs were estimated at \$56,000 per year (ca. \$14 per page) and losses were to be held to no more than \$80,000 for 2000-2004. The reason for giving these figures here is to show that at the same time ESA was unwilling to make certain money by selling IFWA to those authors who wanted it, it was willing to risk high losses by paying large sums to establish restricted-access e-versions. ESA could have earned nearly as much per page by selling IFWA to those who wanted it as it had to pay per page to post articles with restricted access.

By 1999, the Governing Board was coming under increasing pressure from ESA members to approve IFWA sales and, in January 2000, the sales began. IFWA, as currently offered by ESA,

is limited to making the PDF files of articles freely accessible to anyone who views the contents of an ESA journal on the ESA server (<http://www.esa.org/pubs/>). Articles that have IFWA are labeled as “Free PDF.”

In 2000, the first year of sales, authors of 25% of articles elected to buy IFWA, providing a gross income of \$18,390. In the second year, 51% bought IFWA, producing a gross income of \$31,260. The gross for the two years totaled nearly \$50,000 and amounted to \$12.94 per page for IFWA articles. The costs of providing IFWA have not been tallied, but incremental costs should be low, because ESA must make PDF files for all articles for its restricted-access versions whether it sells IFWA or not.

Like most journals, ESA’s journals have been steadily losing institutional subscriptions. The total loss from 1994 through 2001 was 32% (Fig. 2). Beginning in 1999, ESA raised its subscription prices each year thereby ending the divergence of the trend lines for numbers of subscriptions and for inflation-adjusted revenues from those subscriptions. The gross income from IFWA fees for 2000 and 2001 was almost exactly enough to compensate for the decline in ESA’s gross income from institutional subscriptions.

ESA could increase its income from IFWA in several ways. First, it could enhance its IFWA service with the goal of increasing the percentage of authors who buy it. A major enhancement would be to allow authors who purchase IFWA to immediately post their PDF files on any server. Currently, for the first two years following publication, ESA forbids all authors to post their articles on any server, even as part of their own home pages. In addition to permitting authors to make their IFWA articles more easily found, ESA could itself make the articles more easily found. For example, it could seek links from *Current Contents* and other literature indexes and it could post the articles on a server that was compliant with the Open Archives Initiative⁴.

A better service would justify a higher price. ESA's current price for IFWA is 75% of the price of 100 paper reprints, which amounts to \$95 for an article of average length⁵. If ESA chooses to retain the link between IFWA and paper reprint prices, it can raise its IFWA revenues by raising the percentage or by charging more for paper reprints. The latter would be easy to justify because \$126, its current price for 100 paper copies of a 7- or 8-page article, is less than half the average price charged by a sample of nine publishers⁶.

It seems likely that ESA can increase both the price and the penetration for its IFWA service *and at the same time* do no worse with its sales of paper issues and site licenses than publishers who do not sell IFWA. Furthermore, authors are likely to look more favorably on submitting their articles to ESA journals because they offer the IFWA option.

ESA's business plan for its journals, as approved by the Governing Board in June 2000, states that the price of IFWA will be increased to preserve net revenues as subscriptions decline. It also states that ESA will continue to produce and sell subscriptions to print journals for as long as there is a demand and ESA can recover the costs of doing so.

Journal publishers should realize that if they initiate IFWA sales they are not only tapping a new source of revenues but they are also reducing the incentives that authors now have to use other means⁷ to provide IFWA to the final versions of their articles. Authors are less likely to protest copyright agreements or to violate the ones they have signed if publishers provide a legal means, at a fair price, for making the final, formatted, refereed version of articles immediately and freely Web accessible.

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Note

This paper is based on a talk given at the 18th International Learned Journals Seminar:

"We can't go on like this: the future of journals." The PowerPoint presentation for the talk, including the text, is at <http://www.alpsp.org.uk/s120402.htm>. Further details of the electronic publishing efforts of the Florida Entomological Society and the Entomological Society of America are at <http://csssrrvr.entnem.ufl.edu/~walker/epub/index.htm>. The home pages of the journals of the two societies are at <http://www.fcla.edu/FlaEnt/> and <http://www.entsoc.org/pubs/>.

References

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2. That users of journal articles prefer to access e-versions at their computers rather than paper copies in libraries needs no referencing. For evidence that users will not complain about discontinuing paper issues if electronic access is available, see: Goodman, David. A year without print at Princeton and what we plan next. *Learned Publishing* 2002:15(1) January, 43-50.
3. Institute of Scientific Informaton. 2000 JCR Science Edition. *ISI Journal Citation Reports*. [Web edition, licensed to University of Florida]. The three ranks that were averaged were for total citations to articles in the journal, impact factor, and immediacy index.
4. The Open Archive Initiative [OAI] (<http://www.openarchives.org/>) develops and promotes standards that allow institutions to put content on the Internet in a manner that makes the individual repositories "interoperable." The recent Budapest Open Access Initiative (<http://www.soros.org/openaccess/>) gives impetus to OAI because one of the two strategies it

recommends to promote free access to scholarly journal literature is for authors to deposit their articles in OAI-compliant archives.

5. For articles in ESA's four journals in 2001, the average length was 7.2 pages.
6. The nine publishers were American Physical Society, Elsevier, Entomological Society of America, Florida Entomological Society, Oxford, Springer, Taylor and Francis, Tri-Society, and Wiley. Prices ranged from \$95 to \$492 with the average price being \$257.
7. These means include posting author-produced PDF versions of the article (in violation of signed copyright agreements) and (legally) posting the manuscript at the time of original submission and subsequently posting a file describing the changes that were incorporated during the publisher's reviewing and editing procedures. The latter means has long been promoted by Stevan Harnad (e.g., <http://www.cogsci.soton.ac.uk/~harnad/Tp/resolution.htm#Harnad/Oppenheim>)

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Table 1. Chronology of electronic-access services of Florida Entomological Society

Date	Event
1993	Immediate free access endorsed by FES Executive Committee
1994	Immediate free access, via PDF files, implemented
1995	Switch from Gopher to Web
1996	Minimal HTML files added to permit robot indexing
1997	InfoLinks initiated, giving e-access to supplementary materials
1998	Full-text searching implemented
1999	Back-issue project completed (1917-1993 issues; 20,000 pages)
2000	FES Executive Committee approves IFWA fees
2001	IFWA fees (\$100 for articles; \$50 for scientific notes) imposed
2002	ISI to implement hotlinks to full text

Table 2. Chronology of electronic-access services of Entomological Society of America

Date	Event
1995	Governing Board approves IFWA sales
1996	Governing Board approves IFWA sales again
1997	Governing Board cancels its approval of IFWA sales
1998	Governing Board votes to start restricted electronic access
1999	Governing Board approves IFWA sales yet again
2000	IFWA sales begin; 25% penetration
2001	IFWA sales continue; 51% penetration

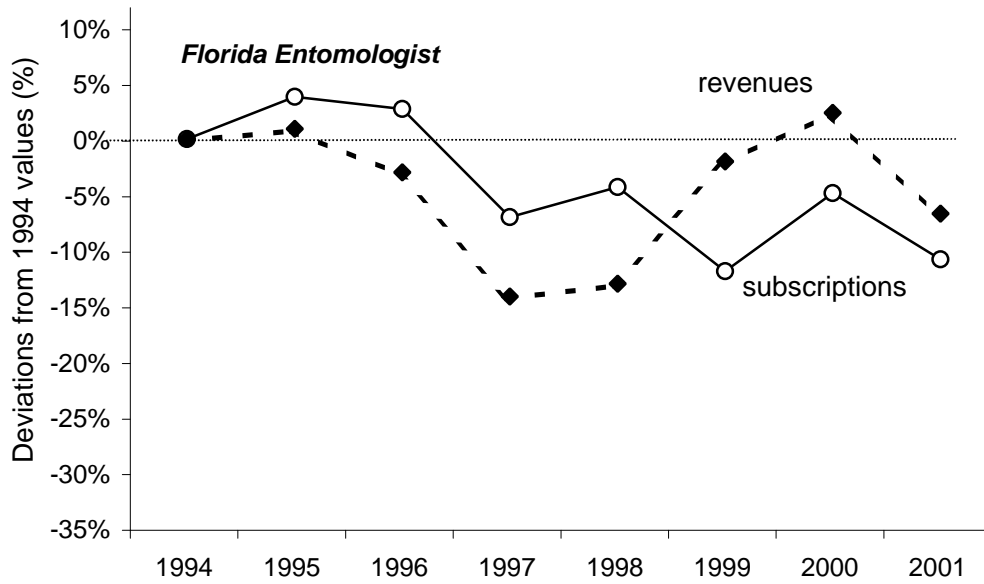


Fig. 1. Numbers of institutional subscriptions and inflation-adjusted gross revenues from those subscriptions, *Florida Entomologist*, 1994-2001. The price of subscriptions was raised from \$40 to \$50 beginning in 1999.

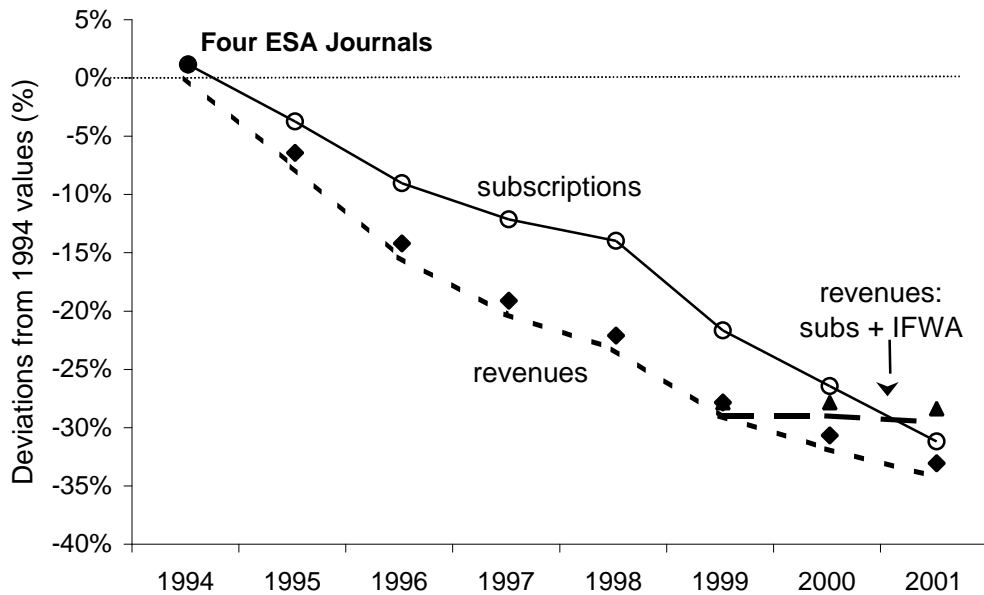


Fig. 2. Numbers of institutional subscriptions and inflation-adjusted gross revenues from those subscriptions, four journals of the Entomological Society of America, 1994-2001. For 2000 and 2001, the effect of adding gross revenues from IFWA sales is shown. Anomalous data for 2000 required that the numbers of subscriptions for that year be estimated by interpolation.

Figure legends

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