

Electronic Journal Timeliness: Comparison with Print

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ABSTRACT: In 1999 and 2000, the Scripps Institution of Oceanography Library analyzed the receipt of its print journal issues with the availability of those same issues online. The 1999 study indicated 16% of the issue numbers we received in print were not available online; thus 84% of our print issues had their online version already available by the time of print receipt, either the same issue number or future issue numbers. The 2000 study indicated 6% of the issue numbers we received in print were not available online; thus 94% of our print issues had their online version already available by the time of print receipt, either the same issue number or future issue numbers.

SCOPE OF THE SURVEY

The Scripps Institution of Oceanography (SIO) Library is one of the University of California San Diego (UCSD) science libraries. Print subscriptions to many of the journals received in the SIO Library have electronic versions available through site licensing. In early 1999 we observed instances when electronic journal issues were not available at the same time our print issues were on shelf. In representing the status of the budget for print journal subscriptions to our academic community, we were uncertain what to say about reliance on electronic journals in lieu of print. This was a major issue for the SIO Library due to substantial and expensive on-campus duplication of high-interest print subscriptions between the SIO Library and its sister science libraries on campus. We did not want to assume a lack of readiness of electronic journals based on anecdotal experience, so we collected data during a six-week study period in 1999. Those data allowed us to assess the online availability of print journal issues we received during the study period. Reliance on electronic journals in lieu of print looked promising at that time but not conclusive. Almost a year later, it seemed that the overall timeliness of electronic journal issues had improved. It was also time to outline a future direction to our academic advisory library committee about canceling on-campus print duplication at SIO Library of high-interest journals available online. Since we needed to represent electronic journal publishing knowledgeably in order to do so, we conducted a follow-up study. We needed to know if we felt convinced that we could forego print for online.

This survey, conducted over two six-week periods (May 14 to July 2, 1999 and April 17 to May 23, 2000), is a snapshot of the timeliness of ejournal issues compared to print issues and is based on our collection and licenses. Our criteria for electronic journal titles included in these surveys were the presence of an "nnet" indicator in our print journal check-in record; this tells us that an electronic version is available. We did not check print issues we received for electronic availability if we did not have a site license.

METHODOLOGY

Using the journal *Sedimentary Geology* as an example, the following describes our data collection process:

1. On 6/2/99 the print issue of *Sedimentary Geology*, volume 125, issue 3-4, is received in the Serials Processing Unit.
2. Print issue 125:3-4 is checked-in using the Innopac serials checkin subsystem. The location "nnet" is present in the checkin record, indicating ejournal availability.
3. Data about the print issue is entered into the survey log: title, publisher, volume, issue, date received, frequency.
4. The next step is to search ROGER, our public catalog, which is our record of site-licensed ejournals for UCSD Libraries. The ROGER catalog record indicates Internet availability of ejournals as well as print holdings (Figure 1). Results indicate the title, *Sedimentary Geology*, is owned by SIO (with call number and shelf location) and the journal is available on the Internet.

| | |
|--|---|
| <i>Title</i> | Sedimentary geology |
| <i>Published</i> | [Amsterdam, New York, Elsevier Scientific Pub. Co.] |
| Click on the following to: | |
| Connect to v.100(1995)- NOTE: Some issues may be lacking. (Access restricted to UCSD IP addresses) | |
| SIO 1 SE27 <i>Loc</i> | SIO Flr 2, 1 Current |
| <i>LIB. HAS</i> | 1- (1967-) |
| <i>Latest Received:</i> | May 1999 125.3-4 |
| <i>Loc</i> | INTERNET |
| <i>Identity</i> | Electronic journal |
| <i>LIB. HAS</i> | 100- (1995-) |

Figure 1. ROGER catalog record for a serial with Internet connection to e-journal content

- In the catalog record, a link to the ejournal is located under the title and publisher information. As directed, click on the link "Connect to v.100(1995)" to access the electronic journal issues on the publisher's Web site.
- Follow the link in the ROGER record to the publisher/title's Web page; determine if the print issue is available in electronic format. On the ejournal Web site, confirm the presence of full text for Sedimentary Geology, volume 124 and issue 3-4. Note: Some ejournals are published ahead of receipt of the print issue; some ejournals publish issues that lag behind their print counterpart. If only abstracts are available in electronic format when checked, the issue is not counted as being available; only journal issues that are available as full text are counted as being available. This methodology cannot determine if the electronic issues are available before the print arrived. However, if an issue is checked for online availability and future issues are available, then this fact is recorded (no. of issues ahead of the current).
- Data about the availability of the full text ejournal issue is entered into the survey log: volume, issue, date and currency: current, ahead or behind the print issue.
- If the full text is not available online, then check again when the next print issue of the journal arrives or at a regular interval during the study period (i.e. for an electronic journal issue behind the print issue, a search is conducted once a week until the electronic journal issue is available or the study period ends).
- Data is entered into an Excel spreadsheet (Table 1) at the conclusion of the survey.

| Journal Title | Publisher | Print vol. & issue | Date Print recv'd | Web volume available | Date ejournal confirmed | No. of issues ahead | Is ejournal Current | No. of issues behind | Frequency |
|--|---------------------------|-------------------------------|--------------------------|-----------------------------|--------------------------------|----------------------------|----------------------------|-----------------------------|--------------------|
| Journal of Structural Geology | Elsevier Science, Ltd. | 21:5 | 6/2 | 21:5 | 6/2 | | Y | | 10 issues per year |
| Journal of the American Chemical Society | American Chemical Society | 121:19 | 6/2 | 121:21 | 6/2 | 2 | | | Weekly |
| Lithos | Elsevier Science, Ltd. | 47:1-2 | 6/2 | 47:1-2 | 6/2 | | Y | | 6 issues per year |
| Pure and Applied Geophysics | Birkhauser-Verlag | 154:2 | 6/2 | 154:2 | 6/2 | | Y | | Monthly |
| Hydrobiologia | | 387-388 | 6/9 | 392:2 | 6/9 | 4 | | | 36 issues per year |

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|---------------------|----------------------------|---------|-----|---------|-----|--|---|---|--------------|
| | Kluwer Academic Publishers | | | | | | | | |
| Sedimentary Geology | Elsevier Science, Ltd. | 125:3-4 | 6/2 | 125:3-4 | 6/2 | | Y | | Monthly |
| Tetrahedron | Elsevier Science, Ltd. | 55:22 | 6/2 | 55:16 | 6/2 | | | 6 | Semi-monthly |
| Tetrahedron Letters | Elsevier Science, Ltd. | 40:23 | 6/2 | 40:15 | 6/2 | | | 8 | Weekly |

Table 1: Sample of data in the Excel spreadsheet

Summary comparisons for the two study periods are presented in Table 2. By 2000, 48% of our received print issues had issues available online that were one or more issue numbers in advance of our issues on shelf (Table 2). Another 46% of our received print issues were the same in issue number as the most recent electronic issue available. It is unlikely that the electronic issue appeared online on the very same day that we received the print issue. Thus, for this 46% of our received print issues, the same electronic issue numbers were available days to weeks ahead of our print receipt. 94% of our printed journal issues were available online either days to weeks in advance of our receipt of print OR one or more issue numbers in advance of our receipt of print. Researchers who closely track the literature to maintain a competitive edge will appreciate this advantage. This gross measure of timeliness increased by 10% between 1999 and 2000.

| | 1999 | 2000 | % change |
|---|-------------------|-------------------|---|
| No of publishers represented | 27 | 34 | |
| No. of unique journal titles | 139 | 174 | |
| No. of print issues received | 249 | 306 | |
| When a print issue was checked-in, the most recent electronic journal issue available was AHEAD in number of the print issue | 35 % (88/249) | 48 % (147/306) | 13% more issues were available online at least one issue ahead of the issue received in print |
| When a print issue was checked-in, the most recent electronic journal issue available was CURRENT (same number) as the print issue | 49 % (124/249) | 46 % (140/306) | |
| When a print issue was checked-in, the most recent electronic journal issue available was BEHIND in number of the print issue | 16% (39/249) | 6 % (19/306) | 10% fewer issues electronically lagged behind the print issue |

Table 2. Comparison of 1999 and 2000 data

Individual publisher data are presented in Table 3. Publisher data should be viewed as a gross and imprecise indicator and not as an indictment. A longer study period and, for some publishers, a larger number of journals would provide a more conclusive picture. Since the sample size is low for some publishers, the reader is cautioned against leaping to conclusions based on the percentages. Site licenses for some publishers became available by the time of the second study period in 2000; therefore some publishers do not have 1999 data.

Typically site licenses were not discontinued between the 1999 and 2000 study periods. Therefore publishers with 1999 data and no 2000 data are curious. Some publishers in that category published issues that we received during the 1999 study period and we received no issues from that publisher during the 2000 study period. They may publish only one title we receive and their natural publication frequency vis-à-vis our six week study period may be the reason we received no issues. Staff may have failed to check electronic issue availability for some titles known in retrospect to be received in print and available online during the later study period, e.g. Science, published by the American Association for the Advancement of Science. Some electronic journals were free, with open trials offered by a publisher, e.g. American Geophysical Union, to gain experience and were not site licensed journals for which timeliness would be expected.

| Individual Publishers 1999: N=27 2000: N=34 | 1999 | | | | | 2000 | | | | |
|---|----------------------|-------------------------|-----------------|------------------|-----------------|----------------------|-------------------------|-----------------|------------------|----------------|
| | # of titles N=139 | # print issues N=249 | ejournal issues | | | # of titles N=174 | # print issues N=306 | ejournal issues | | |
| | | | Ahead N=88 | Current N=124 | Behind N=39 | | | Ahead N=147 | Current N=140 | Behind N=19 |
| Academic Press | 10 | 17 | 41% (7/17) | 59% (10/17) | | 14 | 28 | 64% (18/28) | 36% (10/28) | |
| Acoustical Society of America | - | - | - | - | - | 1 | 2 | | 100% (2/2) | |
| American Association for the Advancement of Science | 1 | 2 | | 100% (2/2) | | NA | NA | NA | NA | NA |
| American Chemical Society | 6 | 17 | 41% (7/17) | 59% (10/17) | | 7 | 20 | 50% (10/20) | 45% (9/20) | 5% (1/20) |
| American Fisheries Society | - | - | - | - | - | 1 | 1 | | 100% (1/1) | |
| American Geophysical Union | 1 | 2 | | | 100% (2/2) | - | - | - | - | - |
| American Institute of Physics | 2 | 5 | 80% (4/5) | 20% (1/5) | | 1 | 4 | 100% (4/4) | | |
| American Meteorological Society | 7 | 13 | 8% (1/13) | 92% (12/13) | | 6 | 8 | 12.5% (1/8) | 87.5% (7/8) | |
| American Society for Biochemistry & Molecular Biology | 1 | 4 | 100% (4/4) | | | 1 | 4 | 100% (4/4) | | |
| American Society for Microbiology | - | - | - | - | - | 2 | 4 | | 100% (4/4) | |
| American Society of Civil Engineers | - | - | - | - | - | 3 | 3 | | 100% (3/3) | |
| American Society of Pharmacognosy | 1 | 1 | | 100% (1/1) | | 1 | 1 | | 100% (1/1) | |
| Birkhauser-Verlag | 2 | 2 | 50% (1/2) | 50% (1/2) | | 2 | 2 | 50% (1/2) | | 50% (1/2) |
| Blackwell Science | - | - | - | - | - | 14 | 17 | | 59% (10/17) | 41% (7/17) |
| British Ecological Society (Blackwell Science) | - | - | - | - | - | 2 | 2 | | 50% (1/2) | 50% (1/2) |
| Cambridge University Press | 3 | 8 | 75% (6/8) | 12.5% (1/8) | 12.5% (1/8) | 3 | 6 | 50% (3/6) | 50% (3/6) | |
| Elsevier Science | 64 | 113 | 25% (28/113) | 44% (50/113) | 31% (35/113) | 33 | 61 | 49% (30/61) | 48% (29/61) | 3% (2/61) |
| Evolutionary Ecology | 1 | 1 | | 100% (1/1) | | | | | | |

| | | | | | | | | | | |
|--|--------------------------|-------------------------|---------------|----------------|---------------|--------------------------|-------------------------|----------------|----------------|--------------|
| IEE Oceanic Engineering Society | | | | | | 1 | 1 | | 100% (1/1) | |
| Institute of Physics | 1 | 1 | | 100% (1/1) | | - | - | - | - | - |
| Japan Whaling Association | - | - | - | - | - | 1 | 1 | | | 100% (1/1) |
| Kluwer Academic Publishers | 9 | 10 | 80% (8/10) | 20% (2/10) | | 11 | 15 | 53% (8/15) | 47% (7/15) | |
| National Academy of Sciences | 1 | 2 | | 100% (2/2) | | 1 | 3 | 33.3% (1/3) | 66.6% (2/3) | |
| Oxford University Press | 4 | 9 | 33.3% (3/9) | 66.6% (6/9) | | 3 | 5 | 80% (4/5) | 20% (1/5) | |
| Pergamon Press | - | - | - | - | - | 28 | 53 | 58.5% (31/53) | 34% (18/53) | 7.5% (4/53) |
| Rockefeller University Press | 1 | 2 | 50% (1/2) | 50% (1/2) | | 1 | 4 | 50% (2/4) | 50% (2/4) | |
| Royal Society of Chemistry | 1 | 3 | 66.6% (2/3) | 33.3% (1/3) | | 2 | 4 | 50% (2/4) | 50% (2/4) | |
| Royal Swedish Academy of Sciences | - | - | - | - | - | 1 | 1 | 100% (1/1) | | |
| Sage Publications | - | - | - | - | - | 1 | 1 | | 100% (1/1) | |
| Science Service | 1 | 3 | | 100% (3/3) | | 1 | 4 | 25% (1/4) | 75% (3/4) | |
| Society for General Microbiology | 1 | 1 | | 100% (1/1) | | 1 | 2 | | 50% (1/2) | 50% (1/2) |
| Society for Industrial and Applied Mathematics | 1 | 1 | 100% (1/1) | | | - | - | - | - | - |
| Society for Molecular Biology & Evolution | - | - | - | - | - | 1 | 2 | | 100% (2/2) | |
| Springer | 1 | 1 | | 100% (1/1) | | - | - | - | - | - |
| Springer-Verlag | 7 | 8 | 38% (3/8) | 62% (5/8) | | 16 | 21 | 57% (12/21) | 38% (8/21) | 5% (1/21) |
| Taylor & Francis | - | - | - | - | - | 2 | 3 | 66.6% (2/3) | 33.3% (1/3) | |
| The Company of Biologists Limited, Cambridge | - | - | - | - | - | 1 | 3 | 100% (3/3) | | |
| The Royal Society | 3 | 4 | 25% (1/4) | 75% (3/4) | | - | - | - | - | - |
| The Scientist, Inc | - | - | - | - | - | 1 | 4 | 25% (1/4) | 75% (3/4) | |
| University of Chicago Press | 3 | 9 | 89% (8/9) | 11% (1/9) | | 2 | 5 | 80% (4/5) | 20% (1/5) | |
| Wiley | 5 | 7 | 43% (3/7) | 43% (3/7) | 14% (1/7) | 8 | 11 | 36% (4/11) | 64% (7/11) | |
| | 139 unique titles (1999) | 249 print issues (1999) | 35% 88/249 | 49% 124/249 | 16% 39/249 | 174 unique titles (2000) | 306 print issues (2000) | 48% 147/306 | 46% 140/306 | 6% 19/306 |

Table 3. Comparison of 1999 and 2000 publisher data

Table 4 (Appendix) lists titles by publisher and indicates how many issues the electronic journal was ahead, current with, or behind the print issue. We assigned publishers to titles using the imprint. For many titles, we received more than one issue during the study periods. For example, as indicated in the third column, three print issues of *Analytical Biochemistry* were received in the 1999 study period. For the first print issue we received of that title, it was available online one issue ahead of the issue received in print, noted as "1". For the second print issue we received of that title, the same issue number was available online with no advance issue numbers available online, noted as "0". For the third print issue we received, that issue was not available online and the electronic journal was one issue behind the print issue in hand, noted as "- 1".

Publication frequency may be a factor in considering timeliness of electronic journals, particularly annual, quarterly, bimonthly and monthly journals. If a quarterly journal is available online one issue number ahead of the print issue number received, there may be considerable time elapsing before that advance online issue is received in print. Those titles with considerable frequency like weeklies would be expected to be timely in publishing online. Terms for frequency came from the catalog record. Some publishers publish on a schedule a bit different from the catalog record's frequency. For example, *Analytical Biochemistry* is published semimonthly except monthly in April and September; the second study period consumed the latter part of April. Some titles below may have been test-published electronic journals like *Geomagnetism and Aeronomy* by the American Geophysical Union, in which case timeliness was not the intent of the electronic publication.

When a received print issue was not available online, a search was conducted once a week for the duration of the study period until the next print issue was received or that lagging electronic issue became available. An example of this situation is the title *Microbiology* published by the Society for General Microbiology; in 2000, the electronic journal was one issue number behind the print issue number when we checked in the print issue. This title continued to be checked online four times during the study period and the issue number we had received in print was not available online. When the next sequential print issue was received during the fifth week, the electronic journal caught up with that lag, and was also current with the new print issue in hand.

Some titles were stellar in publishing online well in advance of receipt of print issues, e.g. *Astrophysical Journal*, *Phytochemistry*, *Journal of Experimental Biology*, *Journal of Molecular Biology*, *Journal of Biological Chemistry*. Titles can be quite variable in publishing online. Two titles that published electronic issue numbers ahead of the print issues we received during our 1999 study also had an electronic issue that lagged behind the print issue (*FEBS Letters* published by Elsevier Science, Ltd., and *International Journal of Climatology* published by Wiley). When the second print issue of Elsevier's *Precambrian Research* was received, the electronic journal was two issue numbers behind. Later in the study period, the electronic journal of *Precambrian Research* was 2 issue numbers ahead of the print issue; the third and fourth electronic issues were one issue ahead of their print counterparts.

A CLOSER LOOK AT EJOURNALS THAT LAGGED ONLINE COMPARED TO PRINT

In the 1999 study, 16% of the received print issues (39 out of 249 issues, representing 21 titles out of a total of 139) had online versions lagging behind in issue number (Table 4, Appendix). For those 21 titles, online issue numbers lagged behind print by 1 to 10 issues. Twelve titles published by Elsevier/Pergamon Press (comprised of 28 issues) were a large portion of that. It was obvious when we looked in 1999 that Pergamon titles were in a development environment while other Elsevier titles were published in more developed production systems and very timely.

The 2000 study data show a 10% reduction in the number of received print issues that had online versions lagging behind in issue number. For the 2000 study period, 6% of the received print issues (19 out of 306 issues, representing 20 titles out of a total of 174) had online versions lagging behind in issue number (Table 4, Appendix). For those 20 titles, online issue numbers lagged behind print by 1 to 7 issues. In 2000, Pergamon titles didn't stand out and were generally as timely as other Elsevier titles. Pergamon timeliness improved greatly in 2000 for some online journals that lagged behind in 1999, namely *Chemosphere*, *Tetrahedron*, *Tetrahedron Letters*, *Tetrahedron*, *Asymmetry*. One Pergamon title, *Physics and Chemistry of the Earth. Part A*,

Solid Earth and Geodesy, lagged behind by 24 issues, showing online production problems during our study period in 2000. When we received the print issue volume 25(1), the electronic journal issues were only available up through volume 23. A subsequent check of this journal showed the electronic journal issues to be current with the print issues in the SIO Library.

CONCLUSIONS

Can we forego print copies in our journal collection and offer our users electronic journals? It isn't that simple since there are factors other than timeliness. Electronic journals impact library public and technical services, such as interlibrary loan, document delivery, reference, binding and preservation, serials claiming, etc. (2) At the population level, the 2000 data showed us that electronic journals are sufficiently timely. Some individual titles are working to improve their production process and would be expected to be more timely in the future. This study showed us that an electronic journal issue is usually available to our users ahead of our print receipt either by days or weeks or by one or more issue numbers. As our users gain experience with electronic journals, we hope they realize that an electronic journal can be available online one or more issue numbers ahead of our library's print issue. We certainly tell them that now.

It is prudent to continue some print journals as long as possible, even if available online. Faculty may express strong preferences for some titles to be continued in print, especially key titles. Certain faculty may need a bridge period to become comfortable with relying on electronic journals instead of the print. Why fight a big battle now over some hot-button titles when this matter will undoubtedly sort itself out in the next few years? Since the SIO Library is a University of California system-wide resource library for marine science, we won't cancel marine-oriented print titles that are available online. We view them as an archival resource at this time.

The SIO Library developed a cancellation strategy with general input from its academic advisory library committee in order to better position resources for continuing subscriptions. The SIO Library had conducted several programmatic cancellations in the 1980s and 1990s. The journals remaining in its collection have demonstrated strong interest from academics and graduate students, and there was still significant overlap in print subscriptions with other on-campus libraries. Since many of these overlapping titles are now available online and we now saw that most of them were reliable in that format, we identified specific print subscriptions to cancel in the years ahead. That strategy was presented to our academic library committee. Buttressed by this study, we were able to present a larger, more balanced perspective when a committee member presented a negative and dated experience with the lack of timeliness of a specific electronic journal included in our study. Negative anecdotal experience can be very difficult to handle in library committee discussion (or individual discussion with academics). Negative impressions can be held and expressed forever even if the situation has improved (as it did in this particular case). The results of this study were invaluable in addressing that outdated impression presented in a group discussion and shifting the discussion to a more balanced perspective.

Titles in the SIO Library's future print cancellation strategy meet two conditions: available online and also in print in other UCSD library collections; and, subject area not a collection strength for the SIO Library compared to sister campus libraries, e.g. molecular biology, cellular/developmental biology, genetics, biochemistry, general chemistry. Academic library committee input suggested that we put off canceling on-campus duplicate titles that were inexpensive annual reviews, had high definition photographs/illustrations, and were in subject areas for which the SIO Library had a collection strength (even though duplicating with sister campus libraries), e.g. microbiology and comparative physiology.

In evaluating the timeliness of online versus print, a print cancellation strategy became evident in which we could move into electronic-only for some journals. Before one can consider canceling a print copy and relying on electronic availability, there must be confidence that the electronic issues will be available at least as timely and reliably as print. At a population level, we feel the answer is yes, with caution advised to identify any problematic titles.

REFERENCES

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APPENDIX: Table 4

| Publisher | Journal Title | 1999 | 2000 | Publication Frequency |
|--|---|-------------|-------------|------------------------------|
| (1999=27; 2000=34) | (unique titles 1999=139; 2000=174) | | | |
| Academic Press | Analytical Biochemistry | 1,0,-1 | 0,2 | Monthly |
| | Biochemical & Biophysical Research Communications | 1,2,1 | 1,3,2,2 | Monthly |
| | Biological Journal of the Linnean Society | 0,0 | 0,1 | Monthly |
| | Cladistics | | 0 | Monthly |
| | Cretaceous Research | 0 | 0 | Bimonthly |
| | Estuarine, Coastal and Shelf Science | | 0 | Monthly |
| | Fish & Shellfish Immunology | | 0 | Monthly |
| | ICES Journal of Marine Science : Journal du Conseil | | 0 | Quarterly |
| | Journal of Fish Biology | 0 | | Monthly |
| | Journal of Fluids and Structures | | 1 | Quarterly |
| | Journal of Invertebrate Pathology | 0 | 0 | Bimonthly |
| | Journal of Molecular Biology | 2,4,2 | 4,4,4,3,3,3 | Weekly |
| | Journal of Theoretical Biology | 0 | 1,1,2 | Semi-monthly |
| | Molecular Phylogenetics and Evolution | 0,0 | | Bimonthly |
| Zoological Journal of the Linnean Society | 0 | 2,1,0 | Monthly | |
| Acoustical Society of America | Journal of the Acoustical Society of America | | 0,0 | Monthly |
| American Assoc. for the Advancement of Science | Science (Weekly) | 0,0 | | Weekly |
| American Chemical Society | Analytical Chemistry | 0,0,0 | 0,1,0,0 | Semi-monthly |
| | Biochemistry | 1,1,1 | 1,2,2,1 | Weekly |
| | Chemical Reviews | 0,0 | 0,0 | Monthly |
| | Environmental Science & Technology | 0,0,0 | 0,-1,0 | Monthly |
| | Journal of Organic Chemistry | 0,0,1 | 0,0 | Bi-weekly |
| | Journal of the American Chemical Society | 1,2,1 | 1,1,1,1 | Weekly |
| American Fisheries Society | North American Journal of Aquaculture | | 0 | Quarterly |
| | Geomagnetism and Aeronomy | -4,-1 | | Bimonthly |

| | | | | |
|---|---|---------|---------|--------------|
| American Geophysical Union | | | | |
| American Institute of Physics | Physical Review Letters | 1,1,1 | 1,1,1,1 | Weekly |
| | Physics of Fluids | 1,0 | | Monthly |
| American Meteorological Society | Bulletin of the American Meteorological Society | 0 | 0,0 | Monthly |
| | Journal of Applied Meteorology | 0,0 | 0,0 | Monthly |
| | Journal of Atmospheric and Oceanic Technology | 0,0 | 0 | Bimonthly |
| | Journal of Climate | 0 | 1,0 | Monthly |
| | Journal of Hydrometeorology | | 0 | Bi-weekly |
| | Journal of Physical Oceanography | 0,0 | | Monthly |
| | Journal of the Atmospheric Sciences | 0,0,1,0 | | Semi-monthly |
| | Monthly Weather Review | 0 | | Monthly |
| American Society for Biochemistry & Molecular Biology | Journal of Biological Chemistry | 1,2,2,2 | 3,2,1,2 | Weekly |
| American Society for Microbiology | Applied and Environmental Microbiology | | 0 | Monthly |
| | Journal of Bacteriology | | 0,0,0 | Semi-monthly |

| Publisher | Journal Title | 1999 | 2000 | Frequency |
|-------------------------------------|---|------|---------------|-----------|
| American Society of Civil Engineers | Journal of Geotechnical and Geoenvironmental Engineering | | 0 | Monthly |
| | Journal of Hydraulic Engineering | | 0 | Monthly |
| | Journal of Waterway, Port, Coastal, and Ocean Engineering | | 0 | Weekly |
| American Society of Pharmacognosy | Journal of Natural Products | 0 | 0 | Monthly |
| Birkhauser Verlag | Cellular and Molecular Life Sciences : CMLS | 1 | | Monthly |
| | Pure and Applied Geophysics | 0 | 1 | Bimonthly |
| | | | | |
| Birkhauser-Verlag (Springer) | Chemoecology | | -1 (4x) | Quarterly |
| Blackwell Science Asia | Australian Journal of Earth Sciences | | 0 | Bimonthly |
| Blackwell Science, Inc. | Conservation Biology | | -1,0 | Quarterly |
| | Ethology | | -2(-1),-2 (1) | Monthly |
| | Fisheries Oceanography | | 0 | Quarterly |
| | Freshwater Biology | | -1 (4x) | Monthly |
| | Geology Today | | -7,1 | Bimonthly |
| | Geophysical Journal International | | 0,-1,0 | Monthly |
| | Global Change Biology | | 0 | Bimonthly |
| | Global Ecology and Biogeography | | 0 | Bimonthly |
| | Immunology and Cell Biology | | 0,-1 (3x) | Bimonthly |
| | Island Arc | | 0 | Monthly |
| | Journal of Applied Ecology | | 0 | Monthly |

| | | | | |
|---|---------------------------------|---------|---------|--------------|
| | Journal of Metamorphic Geology | | 0 | Bimonthly |
| | Sedimentology | | 0 | Monthly |
| British Ecological Society /Blackwell Science Ltd. | Functional Ecology | | 0 | Bimonthly |
| | Journal of Ecology | | -1 (4x) | Quarterly |
| Cambridge University Press | BioEssays | 0,-1 | | Monthly |
| | European Journal of Phycology | | 0 | Monthly |
| | Journal of Fluid Mechanics | 1,1,1 | 2,2,1,0 | Semi-monthly |
| | Meteorological Applications | | 0 | Monthly |
| Cambridge University Press/The Company of Biologists Ltd. | Journal of Experimental Biology | 3,3,2 | 4,4,3 | Bimonthly |
| Elsevier Science, Ltd. | Analytica Chimica Acta | 0,2,1,0 | 0,2,1 | Monthly |
| | Applied Mathematical Modelling | 0,0 | 0 | Monthly |
| | Applied Ocean Research | 0 | | Monthly |
| | Aquaculture | 2,1,2 | 2,1,0 | Monthly |
| | Aquatic Botany | 1,0 | 1,0 | Quarterly |
| | Aquatic Living Resources | | 0 | Monthly |
| | Aquatic Toxicology | 0 | | Quarterly |
| | Atmospheric Research | | 2,1 | Quarterly |
| | Biochimica et Biophysica Acta | 0 | | Monthly |
| | Biological Conservation | 1,0 | 2,2,1 | Monthly |
| | Chemical Geology | 0,0 | | Monthly |
| | Coastal Engineering | 0,0 | 1 | Bimonthly |
| | Earth-Science Reviews | | 0 | Bimonthly |

| Publisher | Journal Title | 1999 | 2000 | Frequency |
|-----------|--|--------|---------|-----------------|
| | Ecological Engineering | | 0 | Bimonthly |
| | Ecological Modelling | 7 | 0 | Monthly |
| | Endeavour | | -1 (4x) | Quarterly |
| | Environmental Pollution | -1,-2 | | Bimonthly |
| | FEBS Letters | -2,2,2 | 2,0,1,2 | Weekly |
| | FEMS Microbiology Ecology | 0 | | Irregular |
| | FEMS Microbiology Letters | 0,0,-1 | 1,1,1 | Semi-monthly |
| | Fisheries Research | 0,0 | 0 | Monthly |
| | Gene | 0,0,0 | 1,0,1 | Semi-monthly |
| | Geomorphology | | 0 | Quarterly |
| | ISPRS Journal of Photogrammetry & Remote Sensing | | 0 | Monthly |
| | Journal of Geodynamics | 0,0 | | Monthly |
| | Journal of Volcanology and Geothermal Research | 0,1 | 0 | 8 issues a year |
| | Lithos | 0 | | Bimonthly |

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|--|---|-----------------|-------------|----------------|
| | Marine and Petroleum Geology | 0 | | Quarterly |
| | Marine Chemistry | 0,0 | 0 | Monthly |
| | Marine Environmental Research | | 0 | Monthly |
| | Marine Geology | 0 | 2,0 | Irregular |
| | Marine Micropaleontology | 0 | 0 | Irregular |
| | Marine Structures | -1,-2 | | Irregular |
| | Mathematical Biosciences | 0 | 0,0 | 10 issues/year |
| | Palaeogeography, Palaeoclimatology, Palaeoecology | | 0 | Monthly |
| | Physics of the Earth and Planetary Interiors | 0 | | 24 issues/year |
| | Precambrian Research | 1,0 | 0,-2(2),1,1 | 16 issues/year |
| | Remote Sensing of Environment | 0 | 0 | Monthly |
| | Sedimentary Geology | 0 | 1,0 | Monthly |
| | Tectonophysics | 2,1,1 | | Irregular |
| | Trends in Biochemical Sciences | | 1 | Monthly |
| | Trends in Ecology & Evolution | -7 | 0 | Monthly |
| Elsevier Science, Ltd. (North-Holland Pub. Co.), 1999 Elsevier Science, Ltd., 2000 | Earth and Planetary Science Letters | 1,1,0 | 1,0,1 | Monthly |
| | Journal of Experimental Marine Biology and Ecology | 0,0 | 3,2,1,0 | Semi-monthly |
| | Journal of Hydrology | 0,1 | 1,0 | Semi-monthly |
| Elsevier Science, Ltd./Pergamon Press | Applied Geochemistry | -1 | 1 | Bimonthly |
| | Atmospheric Environment | 2,3 | 2,1,0 | Monthly |
| | Biochemical Systematics and Ecology | 0 | 1 | Bimonthly |
| | Bioorganic & Medicinal Chemistry | 0 | 0 | Quarterly |
| | Bioorganic & Medicinal Chemistry Letters | -4,-5,-6 | -1,-1(0) | Semi-monthly |
| | Chemosphere | -2,-3,-4, -3 | 3,2,1,2 | Monthly |
| | Computers & Geosciences | -1 | 1,1 | Monthly |
| | Continental Shelf Research | 1,0 | 0 | Quarterly |
| | Deep-sea Research. Part I, Oceanographic Research Papers | -2,-1,0 | 0 | Weekly |
| | Deep-sea Research. Part II, Topical Studies in Oceanography | -1,-2 | | Bimonthly |
| | Environment International | -3 | | Quarterly |

| Publisher | Journal Title | 1999 | 2000 | Frequency |
|-----------|-----------------------------------|------|-------------------|-----------|
| | Geochimica et Cosmochimica Acta | 0 | 0,0,0 | Monthly |
| | Geothermics | | 0 | Quarterly |
| | Journal of African Earth Sciences | -3 | -5 (-3), 1(3x) | Bimonthly |
| | Journal of Asian Earth Sciences | -2 | 1 | Bimonthly |
| | | 0 | 1 | |

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|---------------------------------|---|---------------------|-------------|----------------|
| | Journal of Atmospheric and Solar-terrestrial Physics | | | Semi-monthly |
| | Journal of Geology | | 0 | Monthly |
| | Journal of Structural Geology | 0 | 1,0 | 10 issues/year |
| | Marine Policy | | 0 | Monthly |
| | Marine Pollution Bulletin | -2,-3 | 1,-1(2x) | Irregular |
| | Ocean Engineering | | 1,0 | Monthly |
| | Organic Geochemistry | 0 | | Monthly |
| | Physics and Chemistry of the Earth. Part A, Solid Earth and Geodesy | | -24 | Monthly |
| | Phytochemistry | 3,4,2,3 | 1,0 | Semi-monthly |
| | Progress in Oceanography | | 0 | Monthly |
| | Quaternary International | -1 | 1 | Bimonthly |
| | Quaternary Science Reviews | 1 | 1,0 | Monthly |
| | Tetrahedron | -8,-5,-6, -7 | 2,3,2,2 | Semi-monthly |
| | Tetrahedron Letters | -8,-8,-9, -10,-6 | 4,5,4,3,3,3 | Weekly |
| | Tetrahedron, Asymmetry | -3,-2,-1 | 1,0,1,0 | Monthly |
| | Water Research | 0,0 | 1,2 | Irregular |
| Evolutionary Ecology, Ltd. | Evolutionary Ecology Research | 0 | | 8 issues/year |
| IEE Oceanic Engineering Society | IEEE Journal of Oceanic Engineering | | 0 | Quarterly |
| Institute of Physics | Waves in Random Media | 0 | | Quarterly |
| Japan Whaling Association | Isana | | -1 (5x) | Semi-annual |
| Kluwer Academic Publishers | Aquatic Ecology | | 1 | Quarterly |
| | Boundary-layer Meteorology | 2 | | Monthly |
| | Climatic Change | 2 | | Irregular |
| | Fish Physiology and Biochemistry | | 1,0 | Bimonthly |
| | Hydrobiologia | 4 | | 36 issues/year |
| | Journal of Atmospheric Chemistry | 1 | 1 | Bimonthly |
| | Journal of Chemical Ecology | | 0 | Quarterly |
| | Journal of Paleolimnology | 2,1 | 0 | Bimonthly |
| | Marine Geophysical Researches | 0 | | Bimonthly |
| | Natural Hazards | | 1,0 | Quarterly |
| | Photosynthesis Research | 0 | 1,0 | Monthly |
| | Reviews in Fish Biology and Fisheries | | 0 | Quarterly |
| | Surveys in Geophysics | | 1,0 | Bimonthly |
| | Water, Air, and Soil Pollution | 1 | 2 | 20 issues/year |
| | Biogeochemistry | 1 | 2 | Monthly |

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|---|----------------------|--|---|---------|
| Kluwer Academic Publishers/ Plenum Publishers | Mathematical Geology | | 1 | Monthly |
|---|----------------------|--|---|---------|

| Publisher | Journal Title | 1999 | 2000 | Frequency |
|---|---|-------|-----------|---------------|
| National Academy of Sciences | Proceedings of the National Academy of Sciences of the United States of America | 0,0 | 1,0,0 | Monthly |
| Optical Society of America | Applied Optics | 0,0,0 | | Monthly |
| Oxford University Press | EMBO Journal | 1,1,1 | 1,1,1 | Monthly |
| | Journal of Molluscan Studies | 0 | | Quarterly |
| | Journal of Petrology | 0,0,0 | 1 | Monthly |
| | Journal of Plankton Research | 0,0,0 | | Monthly |
| Rockefeller University Press | Journal of Cell Biology | 0,1 | 1,1,0,0 | Semi-monthly |
| Royal Society of Chemistry | Journal of the Chemical Society. Perkin Transactions I | 0,2,1 | 2,2,1 | Semi-monthly |
| | Natural Product Reports | | 0 | Bimonthly |
| Royal Swedish Academy of Sciences | Acta Zoologica | | 1 | Quarterly |
| Sage Publications, Inc. | Journal of Environmental Engineering | | 0 | Monthly |
| Science Service | Science News (Washington, D.C.) | 0,0,0 | 1,0,0,0 | Weekly |
| Society for General Microbiology | Microbiology | 0 | -1(4x), 0 | Bimonthly |
| Society for Industrial & App. Math | SIAM Journal on Applied Mathematics | 2 | | Bimonthly |
| Society for Molecular Biology & Evolution | Molecular Biology & Evolution | | 0,0 | Monthly |
| Springer-Verlag | Annales Geophysicae. Atmospheres, Hydrospheres, and Space Sciences | 0 | 1 | Monthly |
| | Archives of Microbiology | | -3 (4x) | Monthly |
| | Behavioral Ecology and Sociobiology | | 1 | 8 issues/year |
| | Bulletin of Volcanology | 0 | | 8 issues/year |
| | Climate Dynamics | 1,1 | | Monthly |
| | Contributions to Mineralogy and Petrology | 1 | 1,1 | Monthly |
| | Coral Reefs : Journal of the International Society for Reef Studies | | 0 | Weekly |
| | Current Microbiology | 0 | | Monthly |
| | International Journal of Earth Sciences : Geologische Rundschau | | 0 | Weekly |
| | Journal of Comparative physiology. A, Sensory, Neural, and Behavioral Physiology | | 1 | Monthly |
| | Journal of Comparative Physiology. B, Biochemical, Systemic, and Environmental Physiology | | 1 | Bimonthly |
| | Journal of Geodesy | | 1,0 | Monthly |
| | Journal of Marine Science and Technology | | 0 | Bi-weekly |

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|--|-------------------------------------|---|-----|---------------|
| | Marine Biology | 0 | 0,1 | Irregular |
| | Meteorology and Atmospheric Physics | | 0 | Monthly |
| | Microbial Ecology | 0 | | Bimonthly |
| | Oecologia | 0 | 2,1 | Monthly |
| | Physics and Chemistry of Minerals | | 0 | 6 issues/year |
| | Polar Biology | | 1 | 8 issues/year |

| Publisher | Journal Title | 1999 | 2000 | Frequency |
|-----------------------------|--|---------|---------|---------------|
| Spring-Verlag Wien | Mineralogy and Petrology | | 2,2 | 8 issues/year |
| Taylor & Francis, Ltd | International Journal of Remote Sensing | | 1 | Weekly |
| | Journal of Natural History | | 1,0 | Bimonthly |
| The Royal Society | Philosophical Transactions of the Royal Society of London. Series B, Biological sciences | 0 | | Irregular |
| | Proceedings. Biological Sciences / The Royal Society | 0,0 | | Monthly |
| | Proceedings. Mathematical, Physical and Engineering Sciences | 1 | | Monthly |
| The Scientist, Inc | Scientist | | 0,1,0,0 | Bi-weekly |
| University of Chicago Press | American Naturalist | | 1 | Monthly |
| | Astrophysical Journal | 2,4,3,4 | 0,1,2,1 | Irregular |
| | Physiological and Biochemical Zoology | 0 | | Bimonthly |
| Wiley | Aquatic Conservation : Marine and Freshwater Ecosystems | 0 | 0 | Quarterly |
| | Earth Surface Processes and Landforms | 1,1 | 1,1,0 | Monthly |
| | Geoarchaeology | | 0 | Monthly |
| | Geological Journal | | 0 | Quarterly |
| | International Journal of Climatology | -1,2 | 0,1 | Monthly |
| | International Review of Hydrobiology | | 0 | Monthly |
| | Zoo Biology | 0 | | Bimonthly |
| Wiley, 1999 | Journal of Morphology | 0 | 0 | Monthly |
| Wiley-Liss, 2000 | | | | |
| Wiley-Liss | Journal of Experimental Zoology | | 1 | Irregular |

Table 4. Electronic journals issues available ahead, current with and behind print issues

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