

OPTIMIZING JOURNALS ACCESS FOR UNIVERSITY AQUATIC AND MARINE SCIENCES PERSONNEL

James H. Anderson

BioSciences Library and Institute of Arctic Biology
University of Alaska

ABSTRACT: A sea change in access to scientific journals, with a growing hodgepodge of web-based sources for them, all in the broader context of a sea change in scholarly communication, compelled a major effort to make order out of chaos for users of library-provided online journals. This effort to optimize journals access began with a traditional but aggressive user survey and proceeded through six further specific activities, culminating in getting the word out. As the optimization process will necessarily continue indefinitely, conclusive results for only the first three activities are available. These include a description of a mechanism for prioritizing what are defined as essential journals and accessory journals, and for dealing with a third category inherent in online package deals, peripheral journals. It is argued that a certain amount of chaos will remain inherent in the system, but that optimization of journals access can be achieved through science librarians' vigilance. In particular, they need to create one-stop-shopping lists of primary research journals in major subject areas, with links directly into the journals' pages, bypassing the various database user interfaces which can be confusing for journal readers.

Introduction

Within the past few years there has been a sea change in the way journals in the sciences, as well as all other subject areas, are accessed by students and researchers in the academic environment, as well as by most other people in most other intellectual environments. This sea change has been powered by the unprecedented opportunities for access offered by the Internet, particularly its now primary component, the World Wide Web. The web offers the highly attractive potential of desktop access to journals as well as a multitude of other information sources, mostly indexes to those and other publications. While academic librarians have always had to choose from numerous journal titles in the sciences for their subscriptions, often under strong budget pressure, they now have (1) to choose from even more titles, (2) to deal with the daunting complexities of arranging and paying for selected titles individually or in package Big Deals (Frazier 2001), and (3) to facilitate users' web-based desktop access to those titles.

The issues surrounding and problems involved in providing desktop access to online journals are now widely recognized by science librarians, and this writer is confident that order and focus are evolving. Several books and numerous articles have been generated by librarians and other information managers addressing the issues and problems. This

report describes the development and partial implementation of a systematic procedure for optimizing access to journals for university aquatic and marine sciences and fisheries (AMSF) personnel, and other science personnel. The procedure is based on a project in the BioSciences Library (BSL) in the University of Alaska Fairbanks (UAF), which has a primary responsibility to the University's well known, multi-location School of Fisheries and Ocean Sciences with its Institute of Marine Science and various other organizational entities (Anderson 2000). The project was designed to bring BSL up to date in its responsibilities to its constituency and to make some order out of a chaos of web-based possibilities.

Optimizing journals access simply means providing the titles requested and otherwise needed by students and researchers in the forms most of them prefer in a straightforward, one-stop-shopping manner. The procedure described here and the principles it illustrates should be useful for science librarians elsewhere in their efforts to optimize journals access for their own constituencies.

Background

Although the much expanded array of possibilities for access accompanying the advent of web-based online journals is a rather recent phenomenon, much has already been said and written about it: Indeed, in a presentation like this, one is at risk for repeating some of what has already been discussed and implemented, but of which one is not yet aware. Three important book-length treatments are those of Butterworth (1998), Curtis et al. (2000) and Tenopir and King (2000). Among the more important articles are those of Branin et al. (2001), Frazier (2001), Meyer (2001), Nature Web Debates (2001), Rogers (2001), Schaffner (2001), Stackpole and King (1999), Tenopir (2000), Tenopir and King (2001), and Worlock (2001). Of the several major issues treated by these authors, those most relevant to the immediate effort to optimize journals access include:

determining what journals a science library actually must provide to meet the needs of its user community, whether individual titles should be in paper form, online and desktop accessible, or both, and whether back runs should be held and, if so, whether these are available online to free up shelf space from materials long held in paper form,

the enormous number of science journal titles available to choose from and their widely ranging qualities, particularly as indicated by Journal Citation Reports impact factors, and their widely ranging costs, which for some titles, like Elsevier titles, are extreme,

the much increased number of journals now available online in addition to their availability in paper form *or* online only, while some remain available only in traditional paper form,

the diversity of online sources, including publisher package deals (the “Big Deals” criticized by Frazier (2001)), aggregator vendor or subscription agent packages, and single-title-only subscriptions, all with different web addresses, license requirements, and user interfaces that are confusing and even discouraging to those who want only to access particular journals, and

evaluation of online as well as paper-form journals, as through use statistics, to facilitate decisions for further collection development.

More and more, science librarians are coming to grips with these issues and making noteworthy progress toward optimizing journals access. An exemplary web presentation of online science journals is that of the University of Oregon Library System at libweb.uoregon.edu/network/uoeljrls-sciences.html. However, even here, and at several other libraries’ Web sites which were explored, it is necessary to stumble through sometimes confusing local menu hierarchies, then the various publisher or vendor interfaces in order to actually open the pages of a particular journal.

The *primary product* of the journals access optimization effort should be a condensed list of selected primary research journals at a library’s Web site, to facilitate *one-stop shopping*, where even naïve users can choose their titles and go directly to them, bypassing various vendor or publisher database entry interfaces. Of course, if a very large number of primary research journals is subscribed, then more than one list might be necessary. BSL is generating three, for the life sciences, for the physical and earth sciences and for medicine and health care.

The Problem

The problem in the University of Alaska, as elsewhere, has two major components. First, BSL is mandated to provide access to those journals needed by the teaching, research and public service activities in the broad realm of the life sciences in the University. As these activities change over time, and particularly as new programs are started, periodic review of the needs is necessary, and title lists must be readjusted accordingly. Second, the University’s main library, Rasmuson Library, of which BSL is a part, has subscribed to many online index and full-text databases over the past few years, often in response to package deals that have been fairly attractive cost-wise. The total of such resources is currently 127. This is an impressive offering for a small-university library, but it is a confusing hodgepodge of online resources for University personnel. While many of the needed scientific journals are included in these resources, many others are not. Moreover, there are numerous peripheral and superfluous journals and other periodicals included in the package deals that complicate the ideal one-stop-shopping presentation of the primary titles.

The University makes a well organized presentation of its databases at www.uaf.edu/library/onlinedatabases. (See Table 6, below, for specific full-text databases in the sciences.) It has also engaged the company JournalWebCite to produce a

JournalList of all its journal and other periodical titles. Unfortunately, that list contains thousands of titles, many quite irrelevant, it takes a long time to download, it is clumsy to navigate, and some of the titles are not actually accessible under terms of the Library's license agreements with the various publishers and vendors involved. On the other hand, this resource is of great value as a master list.

Thus the BioSciences Librarian felt obliged to conduct as thorough as possible a survey of users' journal needs, to compare the results with what was already available, to determine whether and how to acquire titles not already available, then to present an updated package of life sciences journals in as straightforward, or seamless, a manner as possible. That presentation would include paper-form journals in the library, if justified by user responses, in addition to desktop access beyond the physical library.

Approach

Seven activities were conceived at the outset as essential to optimizing journals access.

1. Determine what titles are needed. A user survey, as thorough as possible, would be the foundation of the whole optimization process. Obviously this is a standard and traditional step.

A survey was conducted by sending three requests in one e-mail message to a majority of the BSL constituency, as represented on the e-mail distribution lists of the administrative secretaries of four primary organizational entities in the University. These were the School of Fisheries and Ocean Sciences with some 150 names, the School of Agriculture and Land Resources Management with around 90 names, the Department of Biology and Wildlife and associated Institute of Arctic Biology with approximately 85 names, and the Department of Chemistry with 12 names. These numbers give an estimated total of 337 names.

The requests to the user community were three: (a) A list of the journals most important to you, to your students and/or in your specific subject area(s). You may list as many as you want, but if they are more than around five, please arrange them in order of decreasing priority. We need YOUR titles - in effect YOUR VOTES - even if the titles are already available on campus and even if you reckon others will list the same ones. (b) An indication of whether you prefer (i) online access at your desktop, where you can, of course, print articles out for reading and filing, (ii) traditional access in paper form in the library, or (iii) both of these. (c) An indication as to whether it is important to maintain on-campus accessibility, in electronic or paper form, to issues older than five years.

The original distribution of the survey on 11 April 2001 was followed by a reminder three weeks later to encourage further responses. Results from the survey were compiled into a single list, or table, in MicroSoft Access. A similar approach by Christie and Kristik (2001) was discovered only late in the work reported here.

2. Determine the appropriate formats for the needed journals. This was addressed by part (b) of the survey questionnaire. The BioSciences Librarian was well aware of the sea change toward desktop access to journals but wanted confirmation from his own constituency, particularly the AMSF component, that the change was indeed welcome.

3. Compare the titles requested with those already provided by BSL or elsewhere on campus, to determine which ones to add and which ones to cancel if necessary. Determination of the latter would be based not only on lack of mention in the user survey, but also on the judgment of the BioSciences Librarian. Three categories of journals were conceived at the outset: (a) *Essential journals* are those specifically requested by users in the survey or otherwise. (b) *Accessory journals* are those not mentioned in the survey but *otherwise needed* by the Library's constituency more adequately to cover, in the Librarian's judgment, the subject areas involved. (c) *Peripheral journals* are all those included in package deals that are *not specifically selected*. For example, in the database Academic Search Premier in the EBSCOhost service, there are a few essential and accessory journals which make the database worthy of subscription, but there are many others ranging from somewhat to highly irrelevant.

4. Identify appropriate sources of essential and accessory journals not already available on campus. Are they available as components of publisher packages, in subscription vendor or aggregator databases, or only individually from their publishers? Or are they available by individual subscription within a vendor database as in Electronic Collections Online in the OCLC FirstSearch service?

5. Determine the optimum combination of sources, to minimize overlap in coverage between databases and thereby to minimize the overall cost.

6. Facilitate one-stop shopping. While most of the essential and accessory journals are, at least ideally, represented in the University's online catalog, and while one can go from titles found there via links directly to the databases containing them in full text, there must also be a separate list of primary research-based titles to facilitate browsing and quick selections. Moreover, these titles must be linked directly to the journals, bypassing menu sequences and database user interfaces. For users, this is equivalent to, and, presumably, equally as intuitive as, popping into the library and grabbing an issue out of the current display rack. For an older issue, use of the alphabetic Web list would be analogous to *running to the shelves for an issue*. In BSL, journals are, in fact, shelved alphabetically by title, not in call number order.

7. Get the word out. The BioSciences Librarian is obliged, by job description and temperament, to interact with his constituency, to minimize ignorance of and confusion concerning numerous and diverse library-provided resources. Thus he will do everything feasible to promote awareness of his efforts to optimize journals access. In the wash of the metaphorical sea change, it is suggested that other science librarians will also need substantial energy and enthusiasm to serve their individual and organizational constituents optimally.

It must be emphasized that optimization of journals access for AMSF and other personnel is a process that will continue at least as long as the broader sea change in journals access and scholarly communication continues. As such, this is only a status report in which no final results or conclusions are possible, particularly with respect to activities 4 through 7 listed above.

Results

1. User survey. Of the estimated 337 individual faculty and research staff members and graduate students in the life sciences to whom the three survey requests were sent, 53, or 15.4 percent, responded. This appears as a disappointingly low return, but it provided a substantial body of data nonetheless. Moreover, the 53 responses were distributed fairly evenly across the several organizational entities surveyed.

Table 1 is the first 25 titles on the first page of the seven-page list of 328 respondents' titles assembled in Microsoft Access. A title indicated by a respondent as of high priority was given a vote of three for that respondent. A title of intermediate priority was assigned a vote of two, and of low priority, a vote of one per respondent. Cumulative vote totals appear in the second column of Table 1. These data alone form an excellent basis for prioritizing titles in what was defined under activity 3, above, as the essential journals category.

Table 1. The first 25 journals, in alphabetic order, requested in the BioSciences Library user survey.

Journal Title	Votes	Old	Presence	Use	JCR
Accounts of Chemical Research	2		Pr	na	11.8
Acta Agriculturae Scandinavica. B	3		ASP	na	0.29
Acta Crystallographica. Section C	2		na	na	0.58
Acta Horticulturae	3	1	na	na	na
Acta Oceanologica Sinica	3		Pb	na	na
Acta Physiologica Scandinavica	3	1	ECO, BSJ	na	0.56
Acta Theriologica	3	1	Pb	7	0.54
Agricultural and Forest Meteorology	2	1	na	na	1.47
Agronomy Journal	3	1	Pr,WSP	na	0.80
Alaska Fishery Research Bulletin	5	1	Pb,On-I	10	na
Ambio	4	2	Pb	16	0.93
American Biology Teacher	3		Pr	na	0.20
American Journal of Botany	5	2	Pb,WSP,JSTOR	13	2.38
American Journal of Human Genetics	3	1	Pb	6	10.43
American Journal of Physiology	11	4	Pb	44	0.88
American Midland Naturalist	6	2	Pb,ASP,WSP,JS	7	0.50
American Naturalist	30	8	Pb,JSTOR	36	3.93
American Scientist	9	3	Pr,Pm,WSP	na	1.69
American Zoologist	3		Pb,WSP	12	2.71
Angewandte Chemie : Intrnl. Engl. Ed.	3	1	na	na	7.80
Animal Behaviour	10	2	Pb	71	2.15
Annals of Botany	9	3	Pb	8	1.33
Annals of Neurology	1		Pb	na	8.32
Antarctic Science	3	1	Pr,Pm	na	1.17
Applied and Environmental Microbiol.	11	5	Pb	31	3.54

Thus by resorting the Access list by the votes in the second column, the highest-priority titles, according to the respondents, are quickly seen, as in Table 2. The first five of these titles are, not surprisingly, *Science*, *Ecology*, *Nature*, *Oecologia*, and *Proceedings of the National Academy of Sciences (PNAS)*. The highest-priority title in the AMSF realm, the 14th on the list of 328 titles, is *Canadian Journal of Fisheries and Aquatic Sciences*, and the second in this category, number 22 on the list, is *Limnology and Oceanography*. This sorting device alone would go a long way toward selecting titles to retain if budget constraints forced a severe treatment.

Table 2. The first 25 titles in decreasing order of total votes cast in the user survey.

Journal Title	Votes	Old	Presence	Use	JCR
Science	52	7	Pr,Pm,ASP,JSTO	na	24.59
Ecology	48	12	Pb,JSTOR	217	3.57
Nature	47	8	Pb,Pr,Pm,On-I	178	29.49
Oecologia	44	10	Pb	152	2.16
Proceedings - National Academy of Sci.	36	9	Pb,Pm,JSTOR	105	10.26
Canadian Journal of Zoology	33	9	ECO	na	1.02
Oikos	33	9	Pb	98	2.57
Evolution	32	9	Pb,BioOne,JSTO	51	3.73
American Naturalist	30	8	Pb,JSTOR	36	3.93
Ecological Monographs	30	7	Pb,JSTOR	37	4.45
Journal of Wildlife Management	27	6	Pb	109	1.35
Ecological Applications	26	6	Pb,JSTOR	52	2.78
Arctic, Antarctic and Alpine Research	25	5	Pr,Pm	na	1.44
Canadian J of Fisheries and Aquatic Sci.	24	1	ECO	na	1.96
Journal of Mammalogy	24	7	Pb	83	1.01
Biogeochemistry	24	7	ECO	18	2.04
Trends in Ecology and Evolution	23	6	Pb,EWE	83	7.62
BioScience	21	4	Pb,ASP,WSP	na	3.08
Global Change Biology	21	4	ASP,ECO,BSJ	na	3.01
Global Biogeochemical Cycles	20	5	na	na	4.31
Journal of Climate	20	4	Pm	na	3.23
Limnology and Oceanography	19	6	Pb,JSTOR	33	3.02
Climatic Change	19	4	Pm	na	1.87
Journal of Ecology	18	5	ECO,JSTOR	na	2.51
Journal of Vegetation Science	18	4	na	na	1.96

Using the versatility of Microsoft Access, the same basic list is readily resorted by data in the other columns. Table 3 provides a quick overview of those titles for which back runs were considered most important by respondents. The first five titles for back runs are *Ecology*, *Oecologia*, *Evolution*, *PNAS*, and *Canadian Journal of Zoology*.

Table 3. A resorting of the complete Microsoft Excel list of requested journals on data in the Old column, showing the 25 titles for which back runs were considered most important.

Journal Title	Votes	Old	Presence	Use	JCR
Ecology	48	12	Pb,JSTOR	217	3.57
Oecologia	44	10	Pb	152	2.16
Evolution	32	9	Pb,BioOne,JSTO	51	3.73
Proceedings - National Academy of Sci.	36	9	Pb,Pm,JSTOR	105	10.26
Canadian Journal of Zoology	33	9	ECO	na	1.02
Oikos	33	9	Pb	98	2.57
American Naturalist	30	8	Pb,JSTOR	36	3.93
Nature	47	8	Pb,Pr,Pm,On-I	178	29.49
Biogeochemistry	24	7	ECO	18	2.04
Science	52	7	Pr,Pm,ASP,JSTO	na	24.59
Ecological Monographs	30	7	Pb,JSTOR	37	4.45
Journal of Mammalogy	24	7	Pb	83	1.01
Ecological Applications	26	6	Pb,JSTOR	52	2.78
Trends in Ecology and Evolution	23	6	Pb,EWE	83	7.62
Limnology and Oceanography	19	6	Pb,JSTOR	33	3.02
Plant and Soil	16	6	ECO	na	1.28
Journal of Wildlife Management	27	6	Pb	109	1.35
Marine Ecology Progress Series	17	5	Pb	92	2.02
Arctic, Antarctic and Alpine Research	25	5	Pr,Pm	na	1.44
Journal of Ecology	18	5	ECO,JSTOR	na	2.51
Soil Science Society of America Journal	15	5	Pb	15	1.60
Canadian Journal of Botany	14	5	ECO	na	1.04
Journal of Computational Biology	15	5	na	na	na
Applied and Environmental	11	5	Pb	31	3.54
Global Biogeochemical Cycles	20	5	na	na	4.31

Two of the most important sortings are those of the far right columns, for actual in-library use of paper-form issues and for Journal Citation Reports impact factors. The BioSciences Library, like many others, has long recorded use of journal issues in paper form at the time they are reshelfed by student employees. These data are minimal counts insofar as journals are often reshelfed directly by users, but as such they are all the more meaningful. Thus in Table 4 it can be seen that the five most used titles, using counts for calendar year 2000, are *Ecology*, *Nature*, *Oecologia*, *Journal of Wildlife Management*, and *PNAS*. A little farther down the complete list it can be seen that the five most used AMSF titles are *Marine Ecology Progress Series*, *Marine Mammal Science*, *Marine Biology*, *Journal of Fish Biology*, and *Limnology and Oceanography*.

Unfortunately, use counts for online journals are not yet available, and the sorting represented in Table 4 is, therefore, only partly representational. Use data for online journals will be worked into this component of the optimization process in due course.

Table 4. The 25 most used journals received in paper form in the BioSciences Library. As indicated, some are now also received online.

Journal Title	Votes	Old	Presence	Use	JCR
Ecology	48	12	Pb,JSTOR	217	3.57
Nature	47	8	Pb,Pr,Pm,On-I	178	29.49
Oecologia	44	10	Pb	152	2.16
Journal of Wildlife Management	27	6	Pb	109	1.35
Proceedings - National Academy of Sci.	36	9	Pb,Pm,JSTOR	105	10.26
Oikos	33	9	Pb	98	2.57
Marine Ecology Progress Series	17	5	Pb	92	2.02
Trends in Ecology and Evolution	23	6	Pb,EWE	83	7.62
Journal of Mammalogy	24	7	Pb	83	1.01
Journal of Biological Chemistry	5	2	Pb	72	7.67
Animal Behaviour	10	2	Pb	71	2.15
Canadian Journal of Forest Research	17	4	Pb,ECO	67	1.06
Marine Mammal Science	3		Pb	65	0.97
Environmental Science and Technology	3	1	Pb	64	3.75
Journal of Zoology	6	1	Pb,ECO	63	0.96
Soil Biology and Biochemistry	15	4	Pb,EWE	63	1.49
Forest Ecology and Management	9	3	Pb,EWE	58	0.96
Auk	9	1	Pb	53	1.49
Ecological Applications	26	6	Pb,JSTOR	52	2.78
Condor	10	2	Pb,BioOne	52	1.22
Evolution	32	9	Pb,BioOne,JSTO	51	3.73
Wildlife Society Bulletin	11	1	Pb	49	0.71
Journal of Neuroscience	8	2	Pb	45	8.95
Marine Biology	8	2	Pb	45	1.53
American Journal of Physiology	11	4	Pb	44	0.88

Table 5 is the first 25 titles in yet another sorting of the complete list, this time by JCR impact factors, using the most recent data readily available, those for 1999. These factors, produced by the Institute for Scientific Information, do need to be interpreted within the context of the various subject areas represented. *Limnology and Oceanography*, for example, has an impact factor of 3.02, which appears modest compared with the much

higher factors for the highest 25 titles listed in Table 5. Nevertheless, in the subject area of *Limnology and Oceanography*, 3.02 is a quite respectable rating.

While the prioritization represented in Table 5 cannot be used in isolation to make retention and cancellation decisions, it supplements the three preceding prioritizations. Some thought has been given to combining the respondents' title vote data, the in-library use data, and the impact factors into a single factor for each title. Price should also be brought into the formula. That would facilitate a really conclusive prioritization, but a valid formula for calculating, from these diverse data, such a factor for each title has not yet been discovered or devised.

Table 5. The same list as represented in the preceding tables, sorted again to show the 25 journals requested by survey respondents with the highest ISI JCR impact factors.

Journal Title	Votes	Old	Presence	Use	JCR
Cell	9	3	Pb	23	36.24
Nature Genetics	3	1	Pb	12	30.69
Nature	47	8	Pb,Pr,Pm,On-I	178	29.49
Nature Medicine	2	1	na	na	26.58
Current Opinion in Cell Biology	3	1	na	na	25.63
Science	52	7	Pr,Pm,ASP,JSTO	na	24.59
Physiological Reviews	3	1	Pb	5	23.95
Chemical Reviews	3	1	Pr	na	21.24
Trends in Neurosciences	2		Pb,EWE	7	19.93
Genes and Development	4	2	Pb	9	19.22
Neuron	3	1	Pb	na	16.78
Journal of Cell Biology	3	1	Pb	9	12.88
FASEB Journal	6	2	na	na	11.88
Accounts of Chemical Research	2		Pr	na	11.8
Trends in Pharmacological Sciences	1		Pb,EWE	2	11.70
American Journal of Human Genetics	3	1	Pb	6	10.43
Proceedings - National Academy of Sci.	36	9	Pb,Pm,JSTOR	105	10.26
Circulation	3	1	Pb,PQN	9	9.90
Molecular and Cellular Biology	5	2	Pb	6	9.87
Human Molecular Genetics	1		ASP	na	9.36
Current Opinion in Neurobiology	3	1	Pb	na	9.29
Diabetes	3	1	HSN/C	na	9.02
Journal of Neuroscience	8	2	Pb	45	8.95
Nature Neuroscience	4	2	na	na	8.86
Chemical Society Reviews	1		Pr,ECO	na	8.80

2. Journals format. Request two in the three-part user survey described above under the first optimization activity called for an indication of the extent to which journals should be provided online for desktop access. As expected, a majority of respondents, 42 of the 53, or 79.2 percent, expressed interest in desktop access either additional to or, mostly, instead of in-library paper-form access. Moreover, there is much anecdotal, circumstantial and direct evidence that most journal users who did not respond to the survey also prefer desktop access. The BioSciences Librarian is confident that the few respondents who indicated a preference for traditional access will grow more favorable toward online access as they learn more about its considerable advantages. This, it is believed, will be particularly so when those individuals can be provided with greater assurance that back issues will continue to be available, either online, as in JSTOR, or on the shelf in the library.

Beyond these local findings, the PublicLibraryofScience (PLoS) initiative, now receiving enormous and unprecedented attention, lends undeniable urgency to the transition from paper-form to electronic journals with desktop access. The PLoS initiative and numerous supporting documents, at www.publiclibraryofscience.org/, are promoting a sea change in scholarly publishing, and the implications for the closely related sea change in desktop journals access are clear. The inevitability of the trend is further emphasized by Nature Web Debates (2001).

Notwithstanding the PLoS initiative, confirmation by way of the user survey of a local consensus favoring desktop accessibility greatly facilitates the process of optimizing journals access. Some users responded to request two in the survey with an indication of interest in traditional, in-library paper-form journals. However, those users were mostly older, and the BioSciences Librarian suspects a certain amount of inertia or even nostalgia. Be that as it may, most of those voting for paper also favored the online format. Thus the Librarian is free to focus on moving all journals potentially available online to that format, and that will greatly facilitate the one-stop-shopping objective of the optimization process.

3. To compare respondents' titles with what is currently available in BSL or elsewhere on campus, information in the fourth, or Presence column of the list of 328 titles is provided. In this column, several different codes indicate the availability of currently received issues to UAF personnel and others. Table 6 is a list of those codes.

Table 6. Journals presence codes, indicating availability of current or near-current issues to University of Alaska personnel in paper and electronic forms. Asterisks indicate databases with frustrating embargo periods of up to one year on the full text of many of their scientific journals.

- ASP*** = Academic Search Premier in the EBSCOhost service
BioOne = BioOne, a non-profit company providing journals of several life sciences societies online
BSJ = Journals in the Synergy package of the publisher Blackwell Scientific
EBSCO-Olm = EBSCO Online service, accessible in Mather Library only
ECO = Electronic Collections Online in the OCLC FirstSearch Service
EWE = Elsevier Web Editions in the ScienceDirect Service from Elsevier Publishing
HSN/C* = Health Source, Nursing or Consumer Editions, in the EBSCOhost Service
JSTOR = Journal Storage from JSTOR, a non-profit company providing back runs of journals online, up to within 3-5 years of the present
KOJ = Kluwer Online Journals from Kluwer Academic Publishers
na = not currently available to University personnel. In many cases runs of older issues, previously subscribed, are available. In the Use column, na = not applicable.
On-I = online individually, designating titles available directly from the publisher, not as part of publisher or vendor packages
Pb, Pm, Pr = available in paper form in the BioSciences, Mather or main Rasmuson Library
PQN* and **PQP*** = ProQuest Nursing and ProQuest Psychology Journals
WSP* = Wilson Select Plus in the OCLC FirstSearch service

Of the 328 essential journals, as requested by survey respondents, 81, or 24.7 percent, are “na” titles, meaning that current issues are not received in paper or online forms. Some of these titles were subscribed in the past such that back runs are on the shelves, but they were canceled because of budget cut or other decisions made in earlier periodicals reviews. Now, however, the fact that as many as 81 are wanted by respondents imposes a distinct mandate into the broader process of optimizing journals access. The next step will be to extract these titles onto their own prioritized list. Then, if it is necessary to be selective with the titles on that list, elimination should be straightforward insofar as the respondents’ vote totals for these 81 titles are mostly quite low, ranging from one to seven. Some of them also have quite low JCR impact factors, often less than one. But others have substantial impact factors, readily differentiating the few high-priority “na” titles.

The converse of the “na” title situation is that of the 461 titles on the BSL list of 651 currently received journals that were not mentioned by survey respondents. While a few of these are produced by local agencies and are received at little or no cost (e.g. *Newsletter of the North Pacific Anadromous Fish Commission*), many are prominent

journals with substantial impact factors. At first glance this is embarrassing by suggesting that Rasmuson Library, of which BSL is a part, is spending lots of money on major and costly titles that don't happen to be needed for teaching and research in the University of Alaska.

However, as many as 155, or 33.6 percent, of the 461 currently received non-requested journals have only recently begun to be received. They are now accessible online as components of new package deals from the publishers and certain other of the sources listed in Table 6. Therefore, the presence of these journals is not a result of specific, individual-title selection. Of the *other* 306 non-essential journals (not requested by users but currently received), many do qualify as accessory journals, and few if any are no more than peripheral journals, as these three categories of journals were defined earlier. Indeed, many of these 306 journals are in paper form and receive substantial use in BSL, as is revealed by their use counts. Moreover, most of the 155 non-selected package-deal titles qualify, in the BioSciences Librarian's judgment, as accessory journals, and their recent but inadvertent acquisition is welcome. Examples of these in the AMSF subject realm are *Aquaculture Research, Ecological Management and Restoration, Fish & Fisheries, Global Ecology & Biogeography* and *Phycological Research* from Blackwell Scientific and *Aquaculture International, Aquatic Geochemistry, Fish Physiology & Biochemistry, Journal of Applied Phycology* and *Journal of Oceanography* from Kluwer Academic.

Be that as it may, as the process of optimizing journals access continues, the 461 apparent accessory journals will be extracted from the complete list of currently received titles onto their own list in Microsoft Access or Excel. With use, impact factor and price data, it will be possible to prioritize that list and to select titles that should be retained, to the extent the budget will allow, and others that can be canceled to accommodate new subscriptions to survey respondents' "na" titles. Of course it will not be possible to cancel individual titles in package deals. But on the other hand, this process will facilitate decisions as to whether certain packages should be retained. While the recently subscribed Blackwell Synergy (BSJ) publisher package, for example, provides several accessory journals and a few essential journals, a reasonable alternative might be to add those titles individually to the ECO package in the OCLC FirstSearch service and discontinue subscribing to Blackwell's Big Deal (Frazier 2001). On the other hand, if the BSJ package cost is negligible and promises to remain so, then it should be retained and the corresponding subscriptions in ECO canceled.

Respecting the ongoing and now virtually mandatory migration to all online journals potentially available in that format, it is noted that in the Presence column of the list represented by Tables 1-5, 96 titles, or 29.3 percent of the total of 328 user-requested essential journals, are already provided online in one or more of the publisher and vendor databases identified in Table 6. Moreover, many more titles will soon become available online individually insofar as this form of access accompanies their subscriptions in paper form at little or no additional cost. Currently UAF's individual paper-form journal subscriptions are managed by EBSCO Subscription Services. The delay in adding these titles, such as those from the American Chemical Society, to the many others now also

accessible online has been caused by inadequate staffing to work on the individual license agreements and set up the Web links.

Table 7 is the first 25 titles on the 19-page list of all 651 UAF life sciences titles currently received by BSL or, in a few cases, elsewhere on campus. The first two and a half pages of this list, titled *Primary Life Sciences Journals*, presents explanations, codes and definitions. While all titles are naturally represented in the library catalog, at least when it has been possible to add them, a comprehensive alphabetical list of this sort is very convenient. It facilitates browsing and quick title lookup, and it indicates availability in paper form and/or online. Codes for the online databases are listed in Table 6. Frequently updated paper copies of *Primary Life Sciences Journals* are made available to library users.

The list represented by Table 7 will soon be installed at the UAF Rasmuson Library Web site (www.uaf.edu/library/), along with similar lists for the physical and earth sciences and for medicine, nursing and healthcare. As staffing is available, title-specific URLs for the 356 online titles will be installed to facilitate links directly to those journals' pages, bypassing the various database entry interfaces. The indexing function of all full-text databases except EWE will, of course, be kept readily accessible because of the frequent need of users to do a search before accessing a specific journal.

As 356, or 54.7 percent, of the 651 currently received life sciences journals are online, BSL is well along toward online access to all its journals potentially available in that form. One useful result of a journals access optimization effort of the sort introduced here is confirmation that the right things are already being done.

4. The fourth of the seven prescribed activities in the optimization process is to identify sources of essential journals not already subscribed, as those have been selected from the survey respondents' titles through the prioritizations described above. At the moment it appears that for BSL this will be done mostly in two ways. First, individual subscriptions will be added to the ECO (Electronic Collections Online) database in the OCLC FirstSearch Service through negotiations with the University's representatives at OCLC (Online Computer Library Center in Dublin, Ohio). Second, subscriptions to titles which should be kept in paper form in the Library as well as made accessible online will be entered through EBSCO Subscription Services. It will not be feasible to list these titles individually with the 127 databases on the University's Alphabetical List of Online Resources (www.uaf.edu/library/onlinedatabases). Instead, they will be on the special list *Primary Life Sciences Journals* represented by Table 7.

Table 7. The first 25 titles on the list of 651 currently received primary life sciences journals in the University of Alaska Fairbanks. Date ranges following some titles indicate runs in paper form. Titles in italics are online only.

<i>Acta Agriculturae Scandinavica : Section A, Animal Science</i> ASP 1998—
<i>Acta Agriculturae Scandinavica : Section B, Soil and Plant Science</i> ASP 1998—
<i>Acta Biotheoretica</i> KOJ 1995—
<i>Acta Hydrobiologica</i> 1964—
<i>Acta Oecologica</i> 1990— EWE past 12 months
<i>Acta Physiologica Scandinavica</i> 1950-99 ASP 1998— BSJ 1999— ECO 1997—
<i>Acta Theriologica</i> 1958—
<i>Acta Zoologica</i> 1963-97 MF ASP 1998— BSJ 1999— ECO 1999—
<i>Aerobiologia</i> KOJ 1999—
<i>African Journal of Ecology</i> 1979-99 ASP 1998— BSJ 1999— ECO 1997—
<i>Agricultural and Food Science in Finland</i> 1996—
<i>Agricultural and Forest Entomology</i> BSJ 1999—
<i>Alaska Fishery Research Bulletin</i> 1994—
<i>Alaska Medicine</i> 1959—
<i>Allergy</i> 1978-92 BSJ 1999—
<i>Ambio</i> 1972— BioOne 2000—
<i>American Biology Teacher</i> ERL 1938— BioOne 2000—
<i>American Family Physician</i> ASP 1996— HSN/C 1996—
<i>American Forests</i> 1931— ASP 1994— WSP 1994—
<i>American Journal of Botany</i> 1914— WSP 1999— JSTOR 1914—(5)
<i>American Journal of Epidemiology</i> 1965—
<i>American Journal of Health Studies</i> 1998— ASP 1997— HSN/C 1997—
<i>American Journal of Human Genetics</i> 1949— ASP 1999—
<i>American Journal of Physiology</i> 1919—
<i>American Journal of Sports Medicine</i> 1993— ASP 1992—

5. Optimization activity 5 calls for determining the ideal combination of journals sources, to minimize overlap in coverage between databases and thereby to minimize the overall cost. Examining the list represented by Table 7 reveals that, at present, of the 356 life sciences journals currently received online, 75 are accessible in two different databases. Moreover, as many as 37 are in three different databases. Examples are *Fisheries Oceanography*, *Freshwater Biology*, *Journal of Fish Diseases*, and *Journal of Phycology* in ASP, BSJ and ECO (see Table 6). In a few cases, such as *Conservation Biology*, *Functional Ecology*, *Journal of Animal Ecology*, *Journal of Applied Ecology*, and *Journal of Ecology*, current issues (or near-current in the case of ASP titles) are accessible in three databases, and complete back runs, up to three or five years ago, are accessible in a fourth database, JSTOR. Some of these overlaps are evident in Tables 1-5.

It is increasingly apparent that, given the Great Hodgepodge (this writer's special term) of publisher and vendor efforts, there probably is no ideal combination of sources of online journals with a bare minimum of overlap. There is a strong element of opportunism in the accumulation of online resources. Indeed, Rasmuson Library was convinced to subscribe to the Blackwell Scientific and Kluwer Academic Big Deals (Frazier's (2001) special term) by fairly attractive prices, despite the inclusion of numerous peripheral journals and despite the presence of some of the essential and accessory journals in already available sources, primarily ECO. In addition to the combination of database package sources a library ends up with, it will continue to be necessary to negotiate some needed titles individually, either through a subscription agent like EBSCO or with individual publishers. UAF found it necessary to set up its *Nature* online subscription in the latter fashion and will soon have to do the same for *Science*.

Over the past five years or so Rasmuson Library has accumulated as many as 127 index and full-text databases (www.uaf.edu/library/onlinedatabases). These range from ABI/Inform Global to Zoological Record and are produced by about 20 separate commercial and government entities. This accumulation has resulted from librarians' efforts to provide coverage of all subject areas represented in the University and in response to affordable offers. Even so, certain databases of high priority in the BioSciences Librarian's estimation remain unaffordable, particularly ISI's (Institute for Scientific Information) Web of Science and the American Chemical Society's Web Editions. To acquire such resources as these, it will be necessary to continue the journals prioritizations described above and careful comparisons of databases to identify any which might be canceled, thereby making funds available for the more needed resources. As far as the sciences are concerned, the Librarian suspects that both the recently acquired KOJ and BSJ packages could be canceled insofar as essential and accessory journals in them are otherwise available, particularly as individually selected for the ECO aggregation. On the other hand, his colleagues might rule against this in favor of more adequate journals provision in the humanities, arts and technologies.

It appears that similar opportunistic accumulations of online resources have occurred at many other academic institutions. Moreover, it is to be expected that these accumulations will continue to evolve, with some resources being dropped and new ones added with changing budget priorities and subject area emphases. Much of this evolution will probably continue to be driven by attractive offers of publishers and vendors and the appearance of new Big Deals. Even as a draft of this report was about to be rushed to the editor for publication, an e-mail announcement arrived from the U.S. National Library of Medicine describing a possible and affordable consortium arrangement for 140 online journals in the Journals@Ovid package, some of definite value for the BSL collection.

Thus there seems no point in trying to eliminate overlap in journals coverage between databases, but only to minimize it. As a considerable amount of complexity will remain, efforts should then be directed toward making order out of the chaos by creating locally a few well organized one-stop-shopping user entries.

6. The facilitation of one-stop shopping by way of a few well organized user entries is mostly a matter of putting at a library's web site clean and uncluttered lists of primary titles, of what are defined here as essential and accessory journals. Peripheral journals should be left to the complete JournalWebCite kind of list, with a brief note on the one or very few primary titles list(s) pointing the interested user toward that resource. Essential and accessory journals should also be represented in the library catalog, but not peripheral journals. Of course, journals peripheral to the AMSF and other sciences are not necessarily peripheral in other subject areas for which a university library is responsible. Thus technology, humanities and arts librarians need to create their own lists of essential and accessory journals. Ideally, periodic user surveys would inform the generation of those lists.

The list represented here by Table 7 is an example of an existing list, for the life sciences, that is readily adaptable to web presentation. As such, it will be more convenient for busy students and researchers than the JournalWebCite list already accessible at the library's web site, where links don't bypass the various database user interfaces anyway. Two other lists, for the physical and earth sciences (physics, astronomy, chemistry, geology and climatology) and for medicine, nursing and health care, will be generated in BSL. A substantial portion of the apparent peripheral journals in the several databases listed in Table 6 are, in fact, in the latter broad subject area.

7. Getting the word out, the final activity in the optimization process, involves promoting as widely as possible through a library's constituency the primary journals' one-stop-shopping lists on the web. Besides describing and explaining it orally wherever possible, individually and in seminars, a succinct information sheet or flier must be created and distributed.

For the UAF BioSciences Librarian, this is a particularly compelling activity in the optimization process in that BSL has AMSF-related branch libraries and constituencies in such far-flung locations as (1) Juneau, with the Juneau Center of the School of Fisheries and Ocean Sciences, (2) Seward, with the Seward Marine Center and the nearby Alaska SeaLife Center, and (3) Kodiak, with the Fishery Industrial Technology Center. These facilities were described in some detail by Anderson (2000). In addition, the Librarian is responsible for the information needs of UAF personnel in the Agriculture and Forestry Experiment Station in Palmer. Altogether there are approximately 200 research personnel and graduate students in these several facilities. Because of their separation from the action on the main campus in Fairbanks, it is harder for those students and researchers to deal with the Great Hodgepodge of UAF's online scientific information resources and particularly with the frequent new developments. Thus visits to these facilities to present special seminars and the provision of informational fliers as well as frequent e-mail and telephone explanations are in order.

Conclusions

1. The optimization of journals access for AMSF and other university science personnel will necessarily be an ongoing process, at least until the broader sea change toward desktop access and the closely related revolution in scholarly communication begin to stabilize.
2. The optimization process does require a traditional user survey for identifying essential journals, defined as those actually requested by users. The survey needs to be supplemented by ongoing interaction of the science librarian with the library's users, including casual face-to-face exchanges, somewhat more formal e-mail exchanges, and occasional demonstration seminars.
2. The science librarian's judgment, based on a good knowledge of teaching and research activities throughout the library's constituency, is necessary to identify accessory journals, which might be as many as or more than essential journals.
3. Journals in both categories need to be systematically prioritized according to such data as numbers of users requesting them, use counts, JCR impact factors, and prices. This includes journals already received but not mentioned in the user survey. These prioritizations facilitate selection or cancellation decisions, within budget allowances or constraints and to the extent individual titles can be added to or deleted from currently subscribed publisher and vendor packages.
4. The confusing array of database entry or user interfaces will continue but can be minimized. Minimization is achieved by providing one or a few lists of primary research journals in broad subject areas, comprising essential and accessory journals, with links directly to the journals' contents.
5. The science librarian needs to get the word out concerning the journals access optimization process through the same forms of ongoing interactions as are listed under conclusion 2.

Acknowledgments

Carol Haas and Colleen Sullivan on the BioSciences Library's technical staff were of very substantial assistance in organizing the data from the user survey and updating the Library's *Periodicals Master List* and the list *Primary Life Sciences Journals* extracted from it. Carol's expertise was critical in the writer's attempts to work in Microsoft Access. In the main Rasmuson Library, Lisa Lehman, Electronic Resources Librarian, was of critical assistance in explaining some of the complexities of database acquisition and presentation and in reviewing an early draft of this report. Interactions with two other library colleagues, Pauline Wilson and Dennis Stephens, continue to stimulate the writer in the ongoing journals access optimization process.

References

- Anderson, J.H. 2000. Aquatic and marine science information sources in Alaska. In: *IAMSLIC 99: Recasting the Nets. Proceedings of the 25th Annual Conference of the International Association of Aquatic and Marine Science Libraries and Information Centers* (ed. by J.W. Markham and A.L. Duda), pp. 235-256. Fort Pierce, FL: IAMSLIC.
- Branin, J., F. Groen and S. Thorin. 2001. *The Changing Nature of Collection Management in Research Libraries*. Association of Research Libraries. [Online.] Available: <http://www.arl.org/collect/ changing.html>.
- Butterworth, I., Ed. 1998. *The Impact of Electronic Publishing on the Academic Community : An International Workshop Organized by the Academia Europaea and the Wenner-Gren Foundation. Wenner-Gren International Series 73*. London: Portland Press.
- Christie, A., and L. Kristick. 2001. Developing an online science journal collection : a quick tool for assigning priorities. *Issues in Science and Technology Librarianship* 30: Spring. [Online.] Available: <http://www.istl.org/01-spring/article2.html>.
- Curtis, D., V.M. Scheschy and A.R. Tarango. 2000. *Developing and Managing Electronic Journal Collections : A How-To-Do-It Manual for Librarians*. New York: Neal-Schuman.
- Frazier, K. 2001. The librarians' dilemma : contemplating the costs of the "Big Deal." *D-Lib Magazine* 7(3). [Online.] Available: <http://www.dlib.org/dlib/march01/frazier/03frazier.html>.
- Meyer, R.W. 2001. A tool to assess journal price discrimination. *College and Research Libraries* 62(3):269-288
- Nature Web Debates. 2001. *The Future of the Electronic Scientific Literature*. [Online.] Available: <http://www.nature.com/nature/debates/e-access/Articles/opinion2.html>.
- Rogers, S.A. 2001. Electronic journal usage at Ohio State University. *College and Research Libraries* 62(1):25-34.
- Schaffner, B.L. 2001. Electronic resources : A wolf in sheep's clothing? *College and Research Libraries* 62(3):239-249.
- Stackpole, L.E., and R.J. King. 1999. Electronic journals as a component of the digital library. *Issues in Science and Technology Librarianship* 22: Spring. [Online.] Available: <http://www.istl.org /99-spring/article1.html>.

Tenopir, C. 2000. Moving toward electronic journals. *Library Journal* 125(12):36-38.

Tenopir, C., and D.W. King. 2000. *Towards Electronic Journals : Realities for Scientists, Librarians, and Publishers*. Washington: Special Libraries Association.

Tenopir, C., and D.W. King. 2001. Lessons for the future of journals. *Nature* 413(6857): 672-674.

Worlock, D.R. 2001. The best and worst of times. *Nature* 413(6857):671.

