International Association of Aquatic and Marine Science
Libraries and Information Centers
Conference Series

EVERY CONTINENT, EVERY OCEAN:
Proceedings of the 32nd Annual Conference of the
International Association of Aquatic and Marine Science
Libraries and Information Centers (IAMSLIC)

Editor:
Kristen L. Anderson

32nd Annual Conference of
IAMSLIC held 8-12 October, 2006
at Portland, Oregon

Conference Organizer: Joan Parker

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This is Kris Anderson's synopsis of the 2006 IAMSLIC conference. The opinions and comments expressed here are representative only of the author and may be completely ignored.

Sunday, October 8th

After a rousing three and a half hour long executive board meeting, the conference kicked off with a reception at the conference hotel. It was a fine opportunity to meet and greet friends new and old. The food was excellent though I was surprised how many people didn't know what hummus is. New this year was a fabric and/or music CD exchange, a voluntary approach to expand cultural horizons. As an example, I am the proud owner of a new Aerosmith CD – one of the band members is native to the Woods Hole district - and Marcel will be humming Hawaiian music at work from now on. I wouldn't know what to do with material but I did see some lovely swatches being bandied about.

Monday, October 9th

The conference got into full swing early on Monday morning with Marcel welcoming the group and making a connection with a German saying which roughly translates to people with many talents and intelligence are said to covered with water. Quite appropriate.

The first talk of the day was one of the highlights of the conference as Kristen Metzger, last participating charter member of IAMSLIC, enlightened us with the history of our organization which started in 1975. Kristen was an infant at that meeting…

Following Kristen, Joe Wible talked about Google scanning the Hopkins library collection – which hadn't happened yet as Google is being sued by publishers and this little setback is throwing off their schedule. He discussed copyright issues relating to historical books, the most interesting note is the "Copyright Determinator" a database Stanford created by scanning and OCR'ing the Copyright Office's print records from 1923-1963. Its purpose is to check to see if titles are in the public domain. Use of the database can qualify as "due diligence" in identifying copyright holder. Joe also discussed dissertations.

Two proposals were presented at the first business meeting which would be discussed and voted on at the second business meeting. This was followed by lunch, the apparent highlight of which was Cathy Norton getting her picture taken with Don Shula, former coach of the Miami Dolphins and owner of the hotel restaurant.

Following lunch, representatives from the regional groups gave reports. You can read these for yourself on the IAMSLIC website.

A panel discussion was next with Virginia Allen and Beth Avery promoting Wiki's, Blogs, & RSS feeds. Idea to check out: "Second Life." Gordon Miller then described how an informal group of Department of Fisheries and Oceans head librarians

communicate with each other to coordinate the interactions of those libraries. He was followed by Sonja Kromann who told us how the NMFS libraries have collaborated to create a list of recommendations to NMFS management on how to centralize resources to unify and equate services. Natalie Wiest finished up the session talking about using the OCLC collection analysis tool to look at her collection and then to compare it to the other maritime academies.

After a short break to check out Guin Auction items and swill a beverage, sessions resumed led by Janine Salwasser, a non-librarian from Oregon State University, who has done a needs assessment and is creating a natural resource digital library called *Oregon Explorer*.

Amy Butros then spoke on how there has been a decrease in the number of visits to the library by students and researchers. SIO has instituted a plan to provide incentives to students and informed us on how faculty and researchers would be contacted. Plans included promoting the SIO Library as a great place to study to the UCSD undergrads.

Enrique Wulff couldn't attend.

Josepha Baibuni, of the Papua New Guinea National Fisheries Authority, took the opportunity to talk about her library and how they are digitizing institutional papers using Koha.

Tuesday, October 10th

Geoffrey Salanje presented evidence of increasing technology in Malawi and illustrated how school children are being introduced to computers in an effort to decrease the digital divide within the country. Libraries have greater and better access to online resources and are working to digitize Malawi publications. Geoffrey then served as strict yet smiling moderator for the remainder of the session.

Marian Jiagge told us how the libraries in some African countries are managing information and the services they provide.

Catalina Lopez Alvarez described how 10 representatives from libraries in Caribbean and Latin American countries have coordinated and have instituted a digital repository for the ODIN members. Standards were set to ensure compatibility with ODINAfrica.

Olga Akimova gave a concise overview of how organizations are currently assisting and the kind of support it is hoped they will supply in the future to sustain libraries in European countries in economic transition, ODINECET.

Sakho Cheikh-Ibrahima shared the status of ODIN PubAfrica with the group and explained some of the challenges the participants face.

Both the ODINCARSA and ODINAfrica groups will be renaming their repositories to OceanDocs to make them more intuitively accessible.

Lunch was taken aboard the *Portland Spirit* on the Willamette River. It was a gorgeous sunny fall day and the cruise was super. Attendees had the rest of the afternoon to visit Portland's various gardens, bookstores, lovely waterfront or go shopping. What an excellent opportunity to recharge for the rest of the conference.

Regional groups, committees and the executive board held meetings in the late afternoon, early evening.

Wednesday, October 11th

John Graybeal is responsible for coordinating and standardizing data management for MBARI. They got an NSF grant to build a web space with PLONE to post all their data. Problem is metadata as interoperability is the ultimate goal. The 3 problems:
Transport Protocol – way to transfer the metadata
Content Standard – what data to transfer
Vocabulary – what the contents are
Introduced us to "folksonomies – cooperative classification and communication through shared metadata." Discussed how this has become useful tin identifying and grouping sites by the similarities – normalizing with social bookmarks. Three websites to check out: Connotea, Cite-U-Like, and del.icio.us. More info at marinemetadata.org

Jan Haspeslagh, Lisa Raymond, and Fred Merceur each briefly described their various open archives and institutional repositories. In addition, Fred gave a concise description of his IFREMER OAI harvester.

Stephanie Haas reported on the work of the Aquatic Commons taskforce. This is one of the big topics for this years IAMSLIC business. Stephanie, Pauline, and the rest of the taskforce deserve big kudos for their efforts in pulling together all the information and presenting it in their excellent report.

Courtney Shaw and Suzanne Pilsk chattered (the room had gotten quite chilly, Debra Losey had to loan Courtney a shawl) about the history of nomenclature and how it relates to multiple digitization and Open Access projects currently underway at the Smithsonian Institutes.

The Elsevier rep gave a spiel on Scopus. Tony Horava followed with a discussion of the Scopus implementation at University of Ottawa.

CSA demonstrated a prototype of a new "deep indexing" database they are building of tables, figures, maps, and illustrations found in publications they index. Very cool! Also showed updates to ASFA.

Pat Wheeler just completed a 5-year stint as editor of *Journal of Phycology*. She has advocated change in publishing regarding copyright ownership and pricing to what the market can bear (e.g. Elsevier and Springer models!). She gave an overview of the Phycological Society of America and related some statistics related to the *Journal of Phycology*. For more information checkout:

> www.createchange.org
> Wellcome report – British review of STM publishers in 2004
> OSU Scholarly Communications Task Force

The day's presentations were capped by George Boehlert who has a long history with the Pacific Science Association and challenged the organization to work with PICES.

The conference banquet was held at Portland's Ecotrust building where we enjoyed views of the Pearl District from the roof as we sipped beverages and ate pupus (that's Hawaiian for hor devoures). A buffet dinner followed of salmon, veggies, rice pilaf, and a cheese platter. After dessert there was dancing which was, shall we say, digitized and posted to the web! Great evening.

Thursday, October 12th

The final day commenced with David Liberty of the Columbia River Inter-Tribal Fish Commission talking story of the sacredness of the salmon and the water to Native People. Following that, he explained his work and that of the Commission to conserve salmon and monitor watersheds in relation to treaty rights. He was really interesting and though I didn't mention it earlier, he had shared some Native legends on Tuesday's boat trip. It added a unique perspective to the proceedings.

Barry Brown discussed how he used the North American Benthological Society's annual bibliography as the benchmark for comparing database coverage of freshwater biology.

Bart Goossens and Bonnie Avery combined to give an introduction to the International Union of Forest Research Organizations. IUFRO's main concern is forests and healthy forests rely on healthy aquatic systems and vice versa. IUFRO section 06.03 is the Information Services and Knowledge Organization.

The business meeting ended the day. We voted to implement the amended Regional Group structure and establish the Aquatic Commons for digital materials. Susan Stover invited everyone to Sarasota, FL for IAMSLIC 2007, and the new board members were announced and installed.

And another great conference came to a close. The End. Well actually, now you need to turn the page and read all the great papers in full text so you will really know what you missed!

PORTLAND SPIRIT – PORTLAND, OREGON
TUESDAY, OCTOBER 10, 2006

Dedicated to
Jim Markham
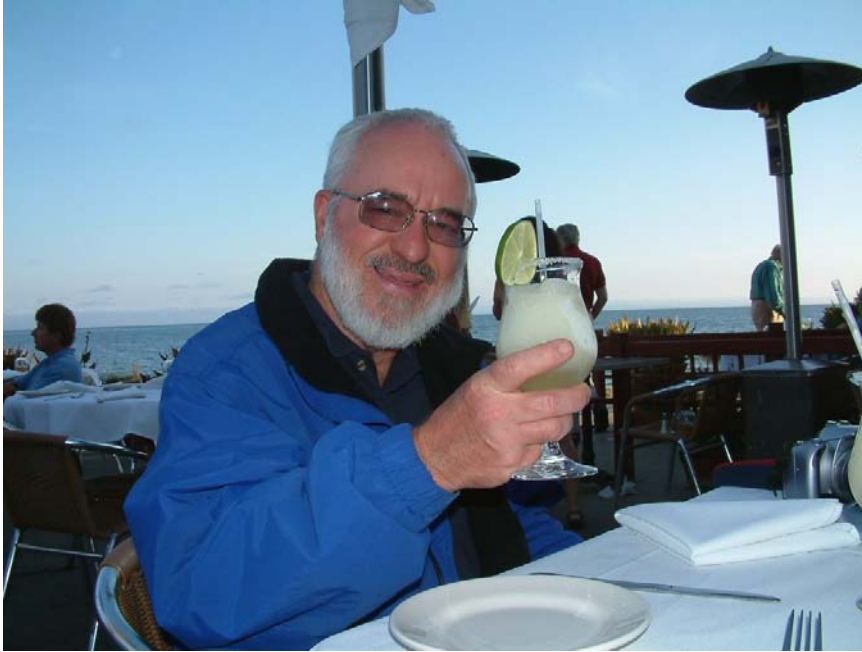
This volume is dedicated to Jim Markham, Editor of the IAMSLIC Conference Proceedings from 1993 to 2005, and worked in this position together with his co-editor Andrea Duda very effectively and accurately.

Jim has decided to retire, and he will be sorely missed. On behalf of all of us, I would like to thank him for all the work that he has done for IAMSLIC over the years.

Marcel Brannemann
IAMSLIC President 2005-2006

A Brief Working History of Jim Markham

After 20 years as Aquatic Sciences/Biology Librarian, German Librarian, and Science/German/Atlas Cataloger at the University of California, Santa Barbara, Jim retired on September 15, 2006, from his second career and first library position. As a marine botanist, Jim was supported by research grants for seaweed research in Seattle, WA; Friday Harbor, WA; Oslo, Norway; Vancouver, BC; Halifax, NS; Vancouver again; and finally, 7 years on the German North Sea island of Helgoland.

INTRODUCTION

Joan Parker
Program Convener

President 2006-2007

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Since 1989, the year I attended my first IAMSLIC meeting in Bermuda, the increase in geographical diversity of conference participants is remarkable. It is no longer a novelty to have members from each of our six regional groups attend conference. I chose this year's theme to reflect this pattern. The composition of the program committee was intended to reinforce the theme – Bart Goossens (Belgium), Geoffrey Salanje (Malawi), Catalina Lopez-Alvarez (Mexico) and Janet Webster (USA). I would like to again thank them for helping shape an excellent program.

This year's conference had eighty-seven participants from eleven countries. I hope they all enjoyed being part of the downtown Portland scene. Coffee, chocolate and wine were very conveniently located right next to the hotel. Thanks to Barb Butler, Todd Hannon, Lenora Oftendahl and Andrea Coffman for making our visit to Portland such a great experience.

Look forward to seeing you all at our next conference.

PRESIDENT'S WELCOME

Marcel Branneman

Ladies and Gentlemen, dear IAMSLIC colleagues and friends,

This is my first visit to Portland and I am very glad to be here. Portland came first to my mind in my pre-librarian life, working as a geologist at the Geological Institute of the University at Freiburg, Germany. This occurred in 1980, during the incredibly powerful eruption of Mount St. Helens. In the institute's lecture hall we looked again and again at the documentation of the eruption and the damage it has done to the landscape. Arriving in Portland by plane, I had a good view of the volcano with its light smoke fan, and I was highly impressed by the dimensions of the area covered by ashes and mudflows generated by the eruption more than 26 years ago. I was amazed at how close this area is to the beautiful city of Portland, which is now hosting the 32nd IAMSLIC conference: Every continent, every ocean.

IAMSLIC comprises Marine and Aquatic Sciences librarians and Information Managers – in fact the first A in our association's acronym stands for Aquatic. Aquatic and Marine, this includes salt water and freshwater, seawater, brackish water, river water, lake water, fountain water, sewage water etc. etc. this means all kinds of waters – so we are the "All-Kinds-of-Waters-Sciences Librarians. All-kinds-of-waters…. This gets me to a German idiom. If a person appears to be very intelligent, has a lot of experience and many skills (can be a little Einstein or a smart used car dealer), such a person in Germany is often said to be "washed with all kinds of waters".

Thus librarians, washed with all kinds of waters, are supposed to be very intelligent and have lots of skills. I believe, we as the IAMSLIC people, the All-Kinds-of-Water-Science' Librarians should especially feel the obligation to improve our skills at being an intelligent human alternative to the virtual "plug in" and "click here for download" world. Finally this is one of the reasons, why we are here – to share our expertise, to learn from each other. BTW: My special congratulation for Kris Metzger having achieved a new professional position.

Another good reason to be here is to meet with colleagues from other libraries, other countries, other continents, to know about their professional and cultural 'habitats', the problems they have to cope with and their success stories. This can be achieved better by meeting people personally not just virtually. For this reason our conference will be an excellent opportunity.

I do wish to all of us a successful conference with interesting talks and fruitful discussions, and wise decisions concerning the future of IAMSLIC.

Many thanks to our sponsors for their contributions and last but not least a big thank you to Joan Parker and Barb Butler with their teams for their hard work, making this conference possible. Now it is up to us to bring it to life.

THE LIFE OF IAMSLIC; FROM OUR PAINLESS BIRTH, THROUGH A SOMETIMES TUMULTUOUS ADOLESCENCE TO THE MATURE, SUBSTANTIVE, OCCASIONALLY DYSFUNCTIONAL, FAMILY WE ARE TODAY

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Abstract: An unflinching look at the 32 year evolution of our
organization, warts and all.

The Beginning

Our organization has now moved into its fourth decade of existence and this year our
executive board decided I was the ideal person to make a presentation on the history of
the organization – ideal, I suppose, because I'm the last active charter member of the
organization not yet on life support.

Our founder, Carol Winn, now retired on Cape Cod and volunteering at the MBL/WHOI
library, was very helpful to me in preparing this presentation. I stopped in Woods Hole,
Massachusetts in June 2006 to look through the archives of IAMSLIC and met Carol for
lunch. It was great talking with about her vision for our group. In 1975, Carol was hired
as the Research Librarian at Woods Hole Oceanographic Institution. Feeling a bit out of
her element, she "needed help" and decided to get input from other marine librarians by
organizing a 2 day meeting. Carol used library addresses on her interlibrary loan list to
send invitations to librarians on the east coast of the United States and Canada and
Bermuda. Twenty-three librarians traveled to Woods Hole that year to attend the first
meeting of the East Coast Marine Science Librarians, hosted by Carol Winn of Woods
Hole Oceanographic Institution and Jane Fessenden of the Marine Biological Laboratory.
Marine librarians from the local area increased the number of attendees to 49.

We met in a drafty, freezing cold, wooden building in Woods Hole and were served
homemade tomato soup. The printed program was nothing more than a list of possible
topics to be discussed. Consequently, the first meeting was very casual and loosely
organized with a very fluid agenda.

Chronology

By the following October, the group had voted to name the organization the Marine
Science Librarians Association. The 1976 meeting in Woods Hole had 72 participants.
For the first time, there was a registration fee of $16. With funding from Sea Grant, a

directory of member libraries was published and distributed There was a demonstration of the Biosis electronic database from Dialog Information Services performed on a Texas Instruments Silent 700 terminal with the telephone receiver plugged into an acoustic coupler. The electronic age in marine libraries had officially been launched.

In 1977, the meeting was held in Washington D.C. and hosted by NOAA librarians. Many attendees felt that the program that year was much too focused on government libraries and there were fears that some attendees would not return the following year. A decision was made at this conference to become a formal not for profit organization. Six years later, we would still be fighting to get tax exempt status.

The conference returned to Woods Hole in 1978 and we became an increasingly formal organization. We were now holding elections of officers and drafting bylaws and articles of incorporation. After much discussion, the organization's name was changed to the International Association of Marine Science Libraries and Information Centers. Frances Swim became the first elected President, following founder Carol Winn's three year tenure as convener. The following year, Treasurer Marilyn Guin announced at our conference in Charleston, South Carolina that she had arranged for incorporation in the state of Oregon.

Gathering in Halifax, Nova Scotia, Canada in October of 1980, we held a joint meeting with the Association of Earth Science Editors. A new Directory of Marine Science Libraries and Information Centers was published and available for sale.

The conference expanded to 3 full days for the first time in 1981. Hosted by Scripps Institution of Oceanography in La Jolla, California, the meetings were increasingly about computer related topics. Archives were established this year and have been housed ever since at Woods Hole Oceanographic Institution in Massachusetts. In the mid 1980's, President Ruth Grundy suggested we publish our conference proceedings and create a position for a proceedings editor. The proceedings were to be abstracted in Oceanic Abstracts and Aquatic Sciences and Fisheries Abstracts. A heated discussion ensued over the suggestion that the proceedings be abstracted in the National Technical Information Service (U.S.) database. Angrily, but appropriately, some Canadian members reminded us all, once again, that IAMSLIC is an international entity and not a United States organization.

Newport, Oregon was the site of the 1986 conference, where bylaws changes were approved, allowing for some travel expenses to be covered for officers and the newsletter and proceedings editor. A duplicate exchange program was established in 1987 and Omnet was adopted as our official method of electronic communication. Electronic mail would change the way we all do business.

The 1989 meeting in Bermuda capped a very big year for IAMSLIC. It marked our first conference to be held off the North American continent and our first president from outside North America, Cecile Thiery. It was also the first year that the

Intergovernmental Oceanographic Committee provided funding for 2 people to attend the conference.   We discussed, heatedly and at length, adding the word "Aquatic" to our name. There were many who feared that the aquatic libraries would overtake the marine libraries; however, this has not happened, possibly because we've done a poor job of recruiting aquatic librarians to join our ranks. A very sad event also marked 1989 – the death of long time member, Marilyn Guin. In her memory, each year we hold a "Guin auction" to fund conference attendees from developing countries. Conference participants donate marine related items and gifts of regional interest to this silent auction each year.

By 1991, we were officially the International Association of Aquatic and Marine Science Libraries and Information Centers. A "twinning" program was approved to provide a buddy system for supporting libraries from developing countries, libraries that might otherwise be unable to afford the cost of IAMSLIC membership.   An ad hoc committee was formed to explore the possible use of the Internet as a means of IAMSLIC networking. For the first time in our history, a Russian member attended our annual conference, held that year in Galveston, Texas.

In the 1990s, we established more of a truly international presence. Our conference was held in Bremerhaven, Germany and for the first time, we were represented at a meeting of UNESCO'S Group of Experts on Marine Information Management (GEMIM) by Tom Moritz. The following year, Pauline Simpson represented us. Following this, we sent representatives to the meeting of the International Oceanographic Data Exchange (IODE). Natalie Wiest was the first attendee in 1996, followed by David Moulder and Pauline Simpson, representing the European Aquatic Sciences Libraries and Information Centres (EURASLIC) and GEMIM.

The 20th anniversary of IAMSLIC was celebrated in Hawaii in 1994 where the program topics concentrated on the role of librarians in the information superhighway. Our organization has grown with and been transformed by the advent of electronic information.

Reykjavik, Iceland was the venue for the 1998 conference, providing the most unique and exotic meeting site to date. Sadly, another longtime member and former president, Ruth Grundy, died during the week of our meeting.   2001 found us convening in Brest, France at a joint conference with EURASLIC. Through the efforts of Ruth Gustafson and her team, the beta version of the new IAMSLIC website was unveiled.

Our first conference to be held in Latin America took place in 2002 in Mazatlan, Mexico. Papers and posters on resource sharing were shared, along with discussion of the newly launched IAMSLIC Z39.50 Distributed Library on the Internet. The Z library, as we call it, provides worldwide interlibrary loan and resource sharing to IAMSLIC member libraries. The Mazatlan conference is also remembered as having the most entertaining, elaborate and professional banquet floor show in the history of the organization. Tasmania, Australia provided an even farther flung venue for the 2004 conference, our

first meeting in the southern hemisphere. The focus of the meeting was open archives initiatives, but everyone still found time to get a glimpse of kangaroos, wombats and Tasmanian devils.

As I stood on the rooftop of the Food and Agricultural Organization (FAO) looking over the beautiful city of Rome at the 2005 conference, I couldn't help but think that Carol Winn had probably never envisioned us in such grand surroundings. During our summer lunch, she told me that although her initial ambitions for the group didn't include an international presence, she is not surprised at all by the size and breadth of the organization since "obviously there was a need." Carol feels that one of the organization's great strengths is that we have always "embraced all oddballs", an observation she makes with affection regarding the great diversity of our members' skills and personalities.

Problems and Controversies

Of course, we haven't survived 3 decades unscathed by problems and controversies. We are fortunate to be as large and active as we are considering that we have never done a really good job of recruiting members; despite adding aquatic to our name, the number of aquatic libraries in the organization is probably smaller than it should be. Over the years, we have had some testy exchanges and prickly relationships with both EURASLIC and the IOC. In the early years, there were occasional power struggles between the United States and Canadian members.

We have sadly lost several members much too early to cancer. Just about every possible library disaster has been experienced by our members – fire, hurricanes, floods, earthquakes and mudslides. We are also not immune to interpersonal squabbles. Any conference that ends with the conference hosts and the conference convener still speaking to one another is considered a success.

We have also lost several members to downsizing by organizations whose lack of vision led to the elimination of the professional librarian position. The misinformed may believe that electronic information has replaced librarians, when actually the information age has simply produced another complex layer of information for librarians to understand, organize and manage.

Accomplishments

The main accomplishment of IAMSLIC has been more than 30 years of education, cooperation and friendship. We have truly cooperated on an international level not only with one another, but with organizations such as GEMIM, the FAO, the IODE and the IOC. The new Aquatic Commons Initiative will greatly benefit our member libraries and their patrons.

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Although regional groups in some parts of the world experienced problems in getting organized, today our regional groups are active and provide education and networking to many library professionals unable to participate in the annual conference. Additionally, they allow members to tackle problems of regional importance, though not necessarily of interest to the organization at large. Our quarterly newsletters and active online discussion list keep members informed and up to date.

The IAMSLIC Z39.50 Distributed Library has enabled members around the world to access the materials of other member libraries. The original concept came from Ann Ball of the NOAA Coastal Services Center. In the past year, the "Z library" has enabled 68 lending libraries in 18 countries to fill requests from 101 libraries in 39 countries. This very successful project owes a special thanks to Steve Watkins for all his hard work and technical expertise.

In Conclusion

IAMSLIC would not flourish as it does today without an enormous amount of work from all its members who have volunteered their time as officers, conferences hosts and conveners, proceedings and newsletter editors, archivists, committee chairs and special project leaders.

A former president, Mary Jane Beardsley, summed up the greatest benefit of IAMSLIC membership – enduring friendships. She said, "I still refer to the IAMSLIC years as when I led an interesting life." Thirty-two years after those 23 librarians traveled to Woods Hole in 1975, we've expanded, grown and traveled, but remain true to their cooperative spirit.

GOOGLE BOOKS, UMI AND OTHER INTRIGUING TRENDS IN DIGITAL PUBLISHING

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ABSTRACT: For science libraries, journal collections almost always dominate in terms of number of volumes and the percentage taken up by the budget. Therefore, the digitization of journal articles has been a primary focus for many years. Between HighWire Press, commercial publishers, and projects such as JSTOR, this is a rapidly maturing industry. What I want to focus on is the digitization of the book, an area that we have not paid as much attention to in recent years. I will divide my talk into three areas: currently published book, historical book collections, and dissertations.

KEYWORDS: copyright, Google Books, dissertations

Currently Published Books

Administrators often become enamored with the possibility of creating a paperless library, probably because of the false hope that significant money can be saved by taking this approach. For example, when the California State University Monterey Bay was being created in 1994, the original founders had a vision of a university with no "brick and mortar" library. While providing access to over 13,000 journals, they were able to limit the number of journals they subscribe to in paper to 489. But books were another matter. Today they have a 60,000+ volume book collection, and they just broke ground on a new 136,151 square foot library with an initial shelving capacity of 152,000 volumes and a potential shelving capacity of 573,000 volumes.

Today, Stanford is in the early planning stages for building a new engineering library. While in the short term they expect the new library to have a print collection, the hope is that it will be significantly smaller in size than the current library's collection and that eventually the print collection will all but go away.

So the question comes up, how many currently published books are available online today? To determine this, Stanford generated a list of books the library purchased over 18 months between September 2004 and February 2006. The list was limited to books with publication years between 2002 and 2006. We then took a stratified random sample

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of 10.2% of the above to create a list of 9271 titles. These titles were then searched in the following sources for full-text books:

Netlibrary
Ebrary
MyiLibrary
Questia
Overdrive
Other (eg. publishers, associations, free-internet)

Note that no consideration was given to the quality of the interface, the ability to print, the price for access, etc. The following table shows how the titles fell into broad subject categories. Note that while Stanford libraries as a whole purchased almost 60% non-English books during this time period, for the sciences less than 2% of the 6,720 titles purchased were non-English.

TABLE 1 - Acquisitions for 9 funding clusters 9/1/2004 - 2/28/2006

Fund Cluster	No. Titles	English	Non-English
General Reference	539	510	29
US/UK History/Lang/Lit	7345	7104	241
All other Area & Language	49679	7651	42028
Humanities	18091	9551	8540
Interdisciplinary	928	867	61
Social Sciences & Education	7162	5665	1497
Sciences	**6720**	**6621**	**99**
Media, Reserve, Vickers UG	602	601	1
Totals	91066	38569 (42.4%)	52496 (57.6%)

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In the chart below you can see the percentage of books available online full-text through any of the sources searched. Note that while the overall percentage for online books was less than 8%, the sciences had the highest percentage with 45%. One contributing factor for the higher percentage is the fact that almost no non-English titles are available online from the sources that were searched. If you eliminate non-English titles, the overall percentage goes up to 18%, but still significantly less than in the sciences.

CHART 1 - E-book availability by broad subject areas

All Subjects/Languages Pct E-book Available

Subject	Percentage
Foreign-language, all subjects	0.10%
English-language, all subjects	17.50%
Area Studies	0.85%
Humanities	8.10%
US/UK History/Language&Literature	9.60%
Social Sciences & Education	19.30%
Sciences & Technology	45.10%
All Subjects/Languages	7.60%
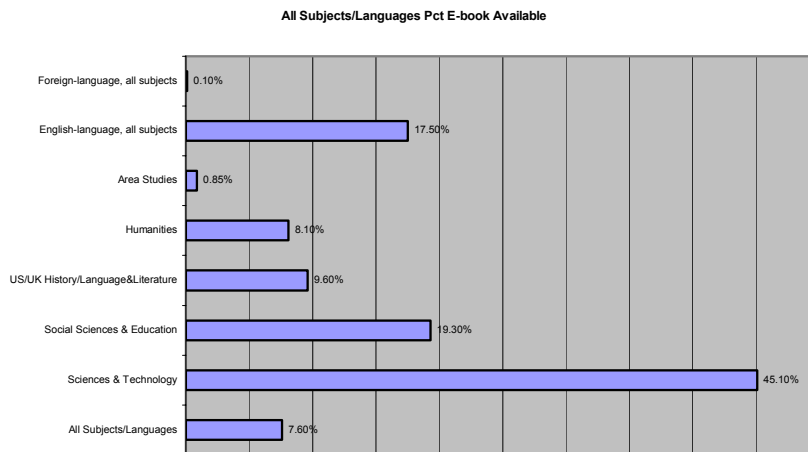
The next chart presents a breakdown among the science disciplines, showing Physics having 66% of its books available online. The marine sciences was less than half of this at 29% available online, but note the very small sample size (N=15).

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CHART 2 - E-book availability in 7 broad subject areas of Science and Technology

SciTech Books Pct E-available

Subject	Percentage
All SciTech	45.10%
Physics	65.80%
Math/CompSci	61.10%
Hopkins Marine	28.60%
Engineering	49.50%
Earth Scis	17.00%
Chemistry	36.70%
Biology	36.40%

(N=15)
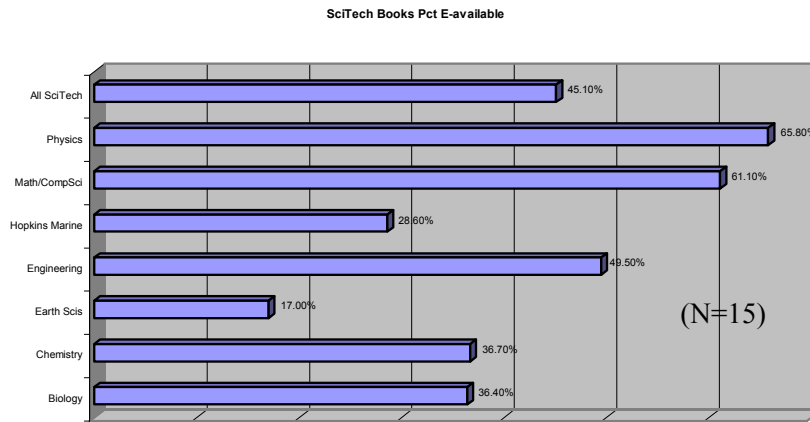
The next chart shows a breakdown by source of how many books were available online. At 12%, NetLibrary had the highest number of online titles Stanford purchased in print over the 18 month period.

CHART 3 - Overall and relative share of e-book availability among suppliers

Pct. Commercial and Other E-avail.

Source	English only	All langs
Free Web	0.00%	0.00%
Other E-source	5.10%	2.20%
OverDrive	2.80%	1.20%
Questia	2.40%	1.00%
MyiLibrary	2.10%	0.90%
ebrary	3.00%	1.30%
NetLibrary	12.30%	5.30%
E-avail.any source or lang	17.50%	7.60%
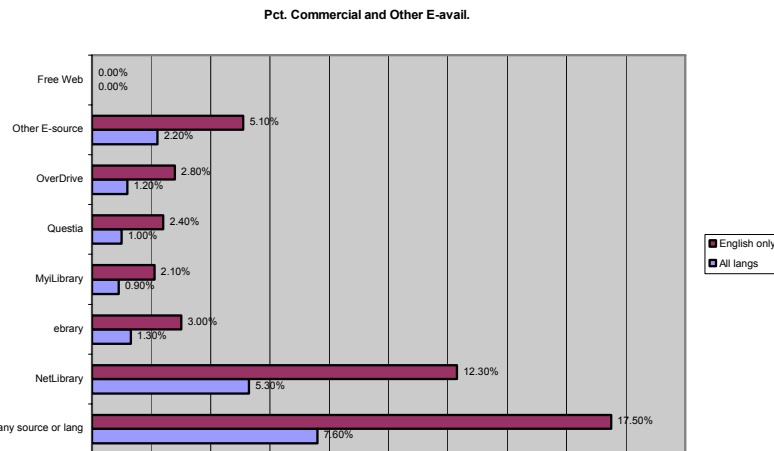
*Note: Individual commercial or other e-source percentages are not mutually exclusive, but do reflect, for example, single-source holdings. Hence, the 5.2% difference between

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NetLibrary's 12.3% and "E-avail. any source or lang" is comprised of titles singly or multiply held by the other e-sources checked and not held by NetLibrary.

Historical Book Collections
Here my plan was to talk about the Google Books project at Stanford, and particularly at Hopkins Marine Station. When I agreed to give this talk, I had expected my collection to be scanned by Google during the second half of August. Due to a variety of circumstances, this got postponed until September, then October, and now indefinitely. Because of confidentiality agreements Stanford made with Google, I can't say more about this. I also discovered that there were many things I planned to talk about that I couldn't, either because of the confidentiality agreement or because of the lawsuit being filed against Google by publishers.

The first question that usually comes up is why is Stanford participating in the project. What would you do with an offer 1) to digitize every book in your library with no damage to the book 2) to return to you a digital copy for preservation and other purposes, and 3) to present you and the world with a combined word index to millions of books?

From Stanford's perspective this is a great opportunity for digital preservation. After the recent flood that destroyed significant parts of the collection at University of Hawaii, wouldn't it have been nice to have a digital backup copy of all the materials? The other opportunity a comprehensive digital collection presents is the ability to provide enhanced services to the Stanford community. Better navigation tools, citation linking, taxonomic & associative searching and examples of services that could be built on top of the digital archive Google is offering to provide free of charge.

So Stanford made the decision to join Harvard, Oxford, University of Michigan, and the New York Public Library in the Google Books project. Since then University of California and Universidad Complutense de Madrid have joined the project.

As I mentioned earlier, I am prevented from describing some of the process due to the confidentiality agreement Stanford signed. On the other hand, I can present you with information that has been made public. For example, I was told I could not tell you how many books per day are being scanned from the Stanford collection. But because of the Freedom of Information Act and the fact that University of California is a public university, I can tell you that Google is scanning 3,000 books per day from the UC collections. Stanford also learned about how the scanning was being done when it was negotiating with Google, but I am not allowed to tell you how. But if you go to the following URLs you will see the fingers in the scanned pages so you can easy deduce how Google is doing the scanning.

  http://books.google.com/books?vid=OCLC03812955&id=1GB1kuY5-pkC&pg=PA3&lpg=PA3
  http://books.google.com/books?vid=0sVgqoZH8_0vk2uEA6uPPZ&id=n-28bvRNoroC&pg=RA1-PR1000

http://books.google.com/books?vid=OCLC03812955&id=1GB1kuY5-pkC&pg=PR32

Another thing I can tell you because you can figure it out for yourself is they are scanning EVERYTHING. Try searching Google Books for "36105" and you will get a huge result. This is because the barcodes placed in the back of every Stanford book starts with that number.

I am allowed to tell you that I had no concern about damage that might be done to the collection during the scanning process. I checked with my colleagues on main campus before I agreed to allow Google to scan the Hopkins Marine Station collection. Everyone was satisfied with the care with which the materials were handled. Yes, some materials did get damaged, but these were items that would have been damaged had any library patron picked up the book and tried to read it. If the book spine was too brittle, anyone using it would have to break the spine. Our patrons are often harder on our books that the treatment they received during the scanning process. Stanford views the project as a great way to systematically go through its collection and identify materials that are in need of conservation. As books are pulled for scanning, suspect items are tested to see if the pages are brittle. If they are, they are put aside for the preservation department to treat.

Copyright
I am sure you are all well aware that the publishers are complaining vehemently about the Google Books project. They are also taking Google to court with the claim that it is a violation of copyright law. I, for one, am glad someone with deep pockets like Google, is willing to take on the publishers who continue to push for rights beyond those they are entitled to by law. Libraries often let publishers get away with this because libraries are not willing to fight the battle in court. Even though the law is on their side, defending those rights is still expensive.

It drives me crazy that every time Mickey Mouse is about to go out of copyright, the Disney lobby convinces Congress to change the law to extend copyright coverage additional years. Right now everything published before 1923 is in the public domain. Everything published after 1963 is in copyright and remains in copyright for 70 years after the death of the author. The tricky part is materials published from 1923 through 1963. Materials published during this time period had to have their copyright renewed after 14 years or they became public domain. Only about 15% had their copyright renewed (200,000). The remaining 85% are in public domain. But which are which? How do you figure out whether something is still in copyright when the publisher may have gone out of business? Or was the publisher was absorbed by some other publisher? Even if you contact the publisher, do they have the records to know whether they renewed the copyright, or do they error in their favor and tell you, yes, they still own the copyright?

If you go to this URL: http://www.copyright.gov/orphan/ ,, you can read the report that went to Congress concerning "orphan works". The report recommends that the rights of

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the user be protected if the user has practiced due diligence in trying to track down the copyright holder. If they can not locate a legitimate copyright holder and one surfaces later, the report recommends that there be a limit to any remedy that can be sought against the user if they made a reasonable attempt to find the copyright holder and were not successful.

So let's go back to the problem of book published from 1923 through 1963. If any of these books had their copyright renewed, that renewal took place between 1950 and 1992. But there are no electronic records for renewals made from 1950 - 1977. Also, the electronic records for renewal from 1978 - 1992 are very limited in terms of what information they contain. Project Gutenberg scanned and transcribed the printed renewal records which can be found at a series of PDF files arranged by date at URL:

http://onlinebooks.library.upenn.edu/webbin/gutbook/author?name= United%20States%20Copyright%20Office

Building on this work, Stanford took this data and the electronic records from the copyright office and created a searchable database called "The Determinator" which can be found at URL:

http://collections.stanford.edu/determinator/

Since the copyright records provide very minimal bibliographic information, Stanford is in negotiations with OCLC to see if the records can be matched against its database to provide a richer set of access points to the copyright information. It is also testing the database against manual searches to determine if the use of the database will provide adequately valid results that meet the "due diligence" requirement described in the "orphan works" report. Stanford is vetting this with legal counsel to see if this database will provide a simple and legally safe way of determining whether a book published between 1923 and 1965 is in the public domain.

Putting the legal aspects of Google Books aside, I also find it interesting that publishers are screaming about how this endeavor is taking away their source of income. From my experience it will do just the opposite.

I understand that when National Academy Press started putting the full-text of their new books online for free, it actually increased the sales of their print books. Who wants to read a 400 page book online? Who wants to take the time to print out 400 pages? As long as the book has a reasonable price, most readers would prefer to buy a copy once they have determined that the book is what they want. How do they know they want to buy the book? They know after they have been given an opportunity to read some of it online.

When a faculty or student from Stanford's main campus wants to borrow a book from the Hopkins Marine Station library and there is a full-text version available online, I always

direct them to use the online copy. It cost me money and there is wear and tear on the books when they are shipped back and forth between the two campuses. I can almost guarantee you that the person will respond saying they really want the printed copy anyway. The only time they don't is when they are under a deadline and can't afford to wait for the print copy to be shipped.

I also can attest to the fact that I have purchased books for the Hopkins library as a direct result of the availability of Google Books. Every so often I go into Google Books and search for the phrase "Hopkins Marine Station". Each time I find more books that have information about Hopkins that I was not aware of before because Hopkins wasn't the primary focus of the book. It may have only been a chapter or even just a paragraph mentioning Hopkins. I almost always buy copies of these books to add to my library's collection. These are book sales that would not have taken place without Google Books.

There are also cases where I have been begging publishers to reprint a book that is no longer available. They rarely believe it is fiscally advantageous to do so. Shouldn't they be working with Google to provide a print-on-demand service which would provide the publisher with a new revenue stream?

Publishers are being short sighted and need to start thinking outside the box.

Dissertations
ProQuest (UMI) has been aggressively moving toward digital submission of dissertations. Last year 15% of all dissertations were submitted electronically. This year it has doubled to 30% and an additional 25 schools are in the queue to switch to digital submission. Currently ProQuest has 1.9 million dissertations in microfilm and 800,000 as PDFs. You can check out the online submission process and use the form by going to URL: http://dissertations.umi.com/

Unfortunately Stanford is on the trailing edge in this area. We still submit our dissertations in print. I have been lobbying with the Registrar to change this practice. The reason I feel this is important is because color is now heavily used in many science dissertations. If the dissertation is submitted as a PDF, it will have color. If it is submitted in print, Proquest will scan it to make a PDF, but is only scans in black & white. They have no plans to scan in color because the files created by scanning in color are too large. PDFs created directly from Microsoft Word do not have this size problem. If someone asks to borrow a dissertation from the Hopkins library, I usually would direct them to purchase a copy from ProQuest if the shipping was going to cost more than the purchase price. But many dissertations being produce by today's marine science students are totally useless if color is lost. So I feel obligated to ship copies since there is no alternative. What if my copy gets lost in shipping? The "backup" copy at ProQuest is not an acceptable backup since it does not have color.

Conclusion
We are still in the early to middle stages of migrating from a print environment to a digital environment when it comes to books. The implications of the switch in terms of the traditional economic model and the existing copyright law are major, which makes life interesting for the practicing librarian.

LIBRARIES MEET THE GRID: LIBRARIANS IN CYBERSPACE

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Abstract
We propose to introduce further the technologies being used in libraries
to further the use of the Web 2.0 phase of global computing. Sources
have been selected to better represent the technologies being discussed.

Introduction
Collaboration is a term used among librarians and with their patrons that is changing.
Traditional patrons whose familiar habits are to come to the library to look up online
information and retrieve material from stacks are being replaced. These replace-ment
users want to be interactive are in a hurry, and want immediate solutions to their
information needs. Library services are evolving to satisfy these information needs.

As new technologies emerge, librarians are taking advantage in order to build toward a
more interactive and a higher rate of satisfaction for users.

In order to realize immediate feedback and work more efficiently librarians are realizing
a need for technologies that allow for feedback, clarification, interaction and immediate
gratification of their information needs. Some of the newest services such as blogging,
podcasting, wikis, instant messaging, RSS aggregator feeds, webcasting,
webconferencing, social net-working, and the use of virtual reality are leading the way
into the future.

Technologies Making the Diffeerence:
Under each category below, we hope to provide you examples of these services that
librarians are promoting with enthusiasm to move us into the next level of cyberspace.

BLOGGING
A blog is a personal web site used to discuss ideas, or make comments and observations. A blog may function as a personal journal. Others can add information to a discussion, but not edit existing content. It is displayed in reverse chronological order, so the most current entry is at the beginning. Blogs almost always contain text, but may also contain pictures, videos, or audio. Each posting has a unique URL. This technology is often used by a single author or a small group to display a specific topic of interest.

Some of the advantages to blogs are 1) since most have WYSIWYG editors, you don't have to learn code so they are easy to do; 2) it's an easy way to share information; 3) you can have multiple authors; 4) it's can give your web page a human touch by adding personal commentary.

Some of the disadvantages to blogs are 1) they must be searched using an external search engine; 2) it can be slow going to plod through the blog; and 3) some people get carried away with stream of consciousness writing.

If you decide to start a blog for your library make sure it has a purpose and that you have the staff to update it regularly.

WordPress
http://wordpress.org/about/
WordPress is open source blogging software used by a large number of bloggers including the New York Times. WordPress is written in PHP, runs under MySQL database and uses a GNU General Public License.

Blogging Libraries Wiki
http://www.blogwithoutalibrary.net/links/index.php?title=Welcome_to_the_Blogging_Libraries_Wiki
This is a blog list of libraries of all types. This is really a wiki with an article that contains the list of blogs for libraries and librarians. There is a discussion tab with a running commentary about the Blogging Libraries Wiki.
Examples:
R.B. House Undergraduate Library Web Log,
http://www.lib.unc.edu/house/ul_blog.html?blogfile=ullibrary

Binghamton Univ. Libraries, Science Library Blog,
http://library.lib.binghamton.edu/mt/science/

Case Western, Kelvin Smith Library Weblog,
http://library.case.edu/ksl/

Drexel Univ. Libraries, List of [their] RSS Feeds,
http://www.library.drexel.edu/blogs/index.html

Coastal and Environmental Sciences, http://lsulibrariessce.blogspot.com/

Georgia State – http:www.library.gsu.edu/news/index.asp

Blog Software Breakdown
http://www.asymptomatic.net/blogbreakdown.htm
If you are wondering which software to use to set up the best blog for your needs, then this site provides a chart to help you do that. Owen Winkler, the author has done a thorough job of providing information about blog software. The chart is a detailed breakdown showing known blogging software and characteristics used to compare their values.

Blogs for Librarians
Theoretical Librarian (Gerry McKiernan) http://theoretical-librarian.blogspot.com/

LIS News – http://www.lisnews.com

Scholarly Electronic Publishing Weblog
http://connect.educause.edu/blog/cwbailey/scholarly_electronic_publishing_weblog_11_20_06/12206
Charles W. Bailey, Jr. has initiated to highlight information about "new scholarly literature and resources" such as books, blogs, and white papers. It is being hosted by Educause.

WIKIS
A wiki is a web site available by permission and additional content can be added and edited.

Some of the advantages are that 1) you can share expertise; 2) collaborative editing can insure accuracy; 3) it's an easy way to create documentation or articles; 4) users don't have to know HTML or an editor.

A few disadvantages can be that people may add incorrect or misinformation and that it takes constant monitoring by the wiki community to insure if it does happen it is corrected.

pbwiki
http://pbwiki.com/
A hosted wiki run by David Weekly of the Bay area. It is free but you must endure ads from Google. For-pay additional space is also available. This is a wiki which is very easy to set up and is very popular.

pmWiki
http://www.pmwiki.org/wiki/PmWiki/PmWikiFeatures

This is an open source wiki software which is very popular. It will run with most web servers that uses PHP scripts.

Wikipedia.com
http://en.wikipedia.org/wiki/Wiki
Largest wiki on the Internet open to editing by anyone. It is used as a comprehensive encyclopedia. Though information is sometimes not reliable, it is one of the most used web sites in the world.

LIANZA/ITSIG wiki
http://wiki.lianza.org.nz
Done by the IT Special Interest Group of the Library and Information Association of New Zealand/Aotearoa. Includes Research SIG which allows anyone to create a page about research projects relevant to New Zealand Libraries.

Library Success: A Best Practices Wiki
Main Page: http://www.libsuccess.org/index.php?title=Main_Page
About Page:
http://www.libsuccess.org/index.php?title=Library_Success:_A_Best_Practices_WikiAbout
"Library Success was created by Meredith Farkas to be a collaborative space for librarians to share success stories and inspire each other to do great things in our own libraries." The site is becoming dated but is a good form for a library wiki.

Library Instruction Wiki – Stop Reinventing the Wheel
http://instructionwiki.org
"The Library Instruction Wiki was originally developed by the Oregon Library Association's (http://www.olaweb.org) Library Instruction Roundtable (http://www.olaweb.org/org/lirt.shtml), all librarians and others interested in library instruction are welcome and encouraged to contribute"
Retrieved from "http://instructionwiki.org/Library_Instruction_Wiki:About"

LIS Wiki
http://liswiki.org/wiki/Main_Page
This wiki was created to augment information about Library and Information Science. It is open to all who are interested.

Online Programming For All Libraries (OPAL)
http://www.opal-online.org/
An online community dedicated to all librarians, offering training, podcasts, and announcements of professional interest.

VIDEO AND IMAGE SHARING
YouTube.com
http://www.youtube.com/index

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http://www.youtube.com/t/about
YouTube is a free service to share original videos via the Internet. Accessible for free download and sharing of videos most of which have been produced using Flash. A popular website that is being purchased by Google.

Flickr
http://flickr.com/learn_more.gne
This is a popular open source photo sharing site.

Photobucket
http://photobucket.com/
Is a free searchable video and audio sharing site.

Podcasting Tools
http://www.podcasting-tools.com/
Podcasting is a way to provide an audio show in MP3 format usually interfaced by using a RSS feed written in XML that includes links to the audio file. Podcasting Tools will tell you all about it.

RSS FEEDS
RSS is generally considered an abbreviation for "Really Simple Syndication." It is a form of XML that allows for easy distribution and updating of headlines to personal webpages, newsreaders and aggregators.   It solves the problem of having to go to may sites regularly by combing all of the headlines with links to the web pages in one place. For those who want to monitor many web sites for updates, RSS can save considerable time.

All About RSS
www.faganfinder.com/search/rss.shtml

RSS for Non-Techie Librarians
http://www.llrx.com/features/rssforlibrarians.htm
This is an article written in 2002 about RSS.

RSS Tutorial
http://www.lawlibtech.com/archives/000560.html
An article about RSS feeds from a law librarian blog.

WEBCASTING AND WEBCONFERENCING
Webcasting and Webconferencing allow for the delivery of programs to people offsite. The programs can be live or archived. The advantage is the program is not stored on the user's computer, but on the producer's server.   Webcasting can be one-way or allow for interaction. Webconferencing is for interaction among the participants using the Internet.

Accela Communications
http://www.accelacommunications.com/products/accelacast/accelacast.html
A commercial webcast site. They will help you with the production and distribution of your webcasts.

Webex
http://www.webex.com/overview/web-meeting-resources.html
A commercial webconferencing company who charges by the amount of time used on the webcast. This is used by SirsiDynix for training and the SirsiDynix Institute.

Infinite Conferencing
http://www.infiniteconferencing.com/web-conferencing-solution.asp
A commercial webconferencing site.

IT World Webcasts
http://www.itworld.com/Webcasts/bytopic/13/index.html
Webcasts available to enhance knowledge about Information Technology.

SirsiDynix Institute
http://www.sirsidynixinstitute.com/
A free online forum of webcasts for the professional development of librarians. Free registration is required and seating is limited.

INSTANT MESSAGING
Libraries use Instant Messaging as a chat resource to do real-time reference service. At designated dates and times, librarians or staff man a workstation in order to be available to interact with patrons. A multi-technological client installed on the PC enables the conversation to take place. Some of the more popular IM clients include Trillion, Gaim, Proteus or Miranda IM.

Yahoo.com, AOL.com, MSN.com all provide IM networks. IM accounts are usually included in the Internet and other online services available.

Trillian
http://www.ceruleanstudios.com/
Allows for chatting across platforms.

Chat Technology for Libraries
http://www.librarysupportstaff.com/4chatinfo.html

IM: Breaking Down Barrier: Instant Messaging in Libraries
http://walkingpaper.org/presentation/IM_CIL205.pdf

SOCIAL NETWORKING SITES
Social Networks can be used to create communities and expand social connections. In a
social network each individual or organization can create a website about themselves.
Through these websites others get to know them and form relationships and communities.

MySpace
http://MySpace.com
A web site devoted to the free sharing of individual information.

Second Life
http://secondlife.com/
A virtual reality community with over 800,000 members. Members join, build an avatar
and live in the second life much as in real life. Members may own land and participate by
using their space as they please. Residents use Linden Dollars in the virtual reality which
can be converted at designated money exchanges to US dollars.
"PC Minimum System Recommendations: Internet Connection: Cable or DSL,
Computer Processor 1.6GHz Pentium 4 or Athlon 2000+ or better, Computer Memory:
512MB or better, Video/Graphics Card: nVidia GeForce FX 5600, GeForce, 6600, or
better, or ATI Radeon 9600, X600, or better."

WebJunction
http://www.webjunction.org/do/Home;jsessionid=C21754E96BD385A719D6BCDFA19
B9058
An online community for librarians to share ideas, do training, make announcements and
have fun.

Infotangle
http://infotangle.blogsome.com/
An author of a forthcoming book on Web 2.0 for librarians. The blog is a conversation in
anticipation of the book directed at librarians. It is a comprehensive look at Web 2.0 and
its associated tools.

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        should-you-care. [Accessed: 5 October 2006].

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THE COUNCIL OF FISHERIES AND OCEAN LIBRARIANS / CONSEIL DES BIBLIOTHÈQUES DE PÊCHES ET OCÉANS – TWENTY FIVE YEARS AND STILL GOING STRONG

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ABSTRACT: In the spring of 1980, a group of librarians of a small Canadian government department, met to discuss problems facing the libraries of the Department of Fisheries and Oceans (DFO).   Each of the DFO libraries was independent. There was no national library budget, each library was dependent for resources upon the agency to which it reported.   There were no national library programs, standards or activities, each library provided a set of services that was characterized by its history, organizational affiliation and resources. The meeting decided to establish a national library network and to manage it by a committee of the department's librarians, the Council of Fisheries and Oceans Librarians / Conseil des bibliothèques de Pêches et Océans (COFOL). Over the past quarter century, COFOL has established an active and effective national library network based on a series of national programs that includes the WAVES / VAGUES union catalogue, a set of common cataloguing standards, a national integrated library system providing circulation and serials management, a digital archive of DFO report literature and national desktop access to electronic subscriptions.   The COFOL model of cooperative management based on consensus and wide participation of its members may be one that can be utilized in other situations.

THE BEGINNINGS

In June 1980, a group of 10 librarians from a small Canadian government department met in Vancouver to discuss problems facing the libraries of the Department of Fisheries and Oceans (DF0). During the meeting, a consensus developed that there was a need for a permanent organization within the department to ensure management support for its libraries. Anna Oxley agreed to draft a set of terms of reference for consideration at the group's next meeting.   In late October 1980, following the Halifax IAMSLIC meeting, the group met again and adopted terms of reference for the *Council of Fisheries and Oceans Librarians / Conseil des bibliothèques de Pêches et Océans* (COFOL). The terms of references were approved the following spring by DFO senior management.

The situation in 1980 -- the Library world
The computer was a critical element of library operation in North America at the start of the 1980's but in a radically different way than we are accustomed today.   Main frames were the platforms on which computer applications were found.   Most automated library systems were custom built systems tailored to the unique combinations of hardware and operating systems found on main frames. Integrated library systems, running a suite of library applications on a common database, were uncommon.   While the Apple II had appeared in 1978, the PC revolution, with its use of common operating systems and application software, awaited the appearance of the IBM personal computer in 1981.

Library catalogues commonly were computer based, but rarely was there public online access.   The most common outputs were microfiche, printouts and card sets. In addition, catalogues normally were limited to one library. Hints of future developments were in the wind, however.   OCLC was beginning to expand beyond its Ohio roots. Melvyl, the University of California system, was testing online access for the University of California network.

Online access to major bibliographic resources was available but usually only through libraries with service accounts.   During the 1970's, many major bibliographic resources, including Biological Abstracts, Chemical Abstracts, ERIC, NTIS, and INSPEC, had appeared as digital databases. Major bibliographic utilities, such as DIALOG, SDC/Orbit and CAN/OLE and QL Systems in Canada, offered these and other databases to libraries. However, the interfaces to these systems and the structure of the databases were complex and trained information specialists were required to conduct searches on behalf of the library's clients. In addition, access was slow and generally limited to dialup access through a local telephone utility. The portable data terminal with acoustic modem was a familiar feature of many libraries at the time.

Resource sharing in 1980 meant interlibrary loan.   The requests were made by mail (post), telex and less frequently by fax. Loans and photocopies were sent by postal mail. New materials received by libraries were almost exclusively in a printed format, although microfiche was becoming more common as an original publication format.

Figure 1: The Institute of Ocean Sciences Library Book Catalogue was housed in the Central computing department

The situation in 1980 – DFO libraries

The Department of Fisheries and Oceans was a new Canadian government department in 1980. It had been created the previous year from the Fisheries and Marine Service and other elements of Environment Canada, which itself had been created 10 years earlier from a variety of Canadian government agency including the Fisheries Research Board of Canada (FRBC) and the Department of Fisheries.   DFO was in midst of creating a new corporate culture from its resource management elements (the former Department of Fisheries) and the research elements (the old Fisheries Research Board of Canada).   It had 13 organized library collections in 1980, 5 in British Columbia, 2 each in Quebec and Nova Scotia, 1 each in Manitoba, Ontario, New Brunswick and Newfoundland. Each of the libraries had a unique history and group of clients, only 2 of them served an exclusively management/policy client group, 8 others served a predominantly science community, and the remaining 3 served a mixed science / management group, although even these 3 were based on former FRBC collections.

DFO did not have a national library program, or a departmental librarian in 1980. Each library received its budget and reported to a non-librarian manager within the regions. Efforts by the Environment Canada Head Librarian in the mid 1970's to create a more organized, coordinated, centralized library network had foundered against the objections of senior fisheries managers (most from the former FRBC sites).   Consequently, each DFO library was independent. There was no common budget or program to share resources, there were no common library programs, there was no common reporting structure, there were no common standards for library service or staffing of the libraries and there was no structure through which the DFO libraries could cooperate or share

experiences. In particular, there was a wide variation in the level of resources provided to the DFO libraries. Several of the libraries had only 1 or 2 staff members, while others had a dozen or more to serve similar user groups. In addition, there was no standardization in the level of staffing in the libraries – some libraries were managed by trained librarians, others by trained library technicians and others by untrained clerks with extensive experience in libraries.
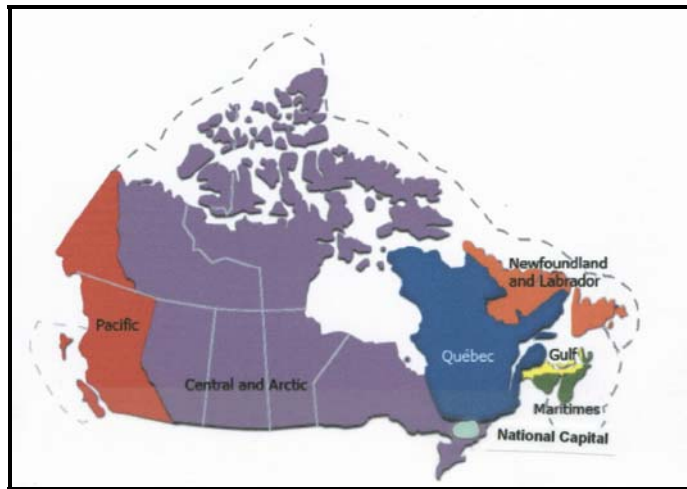
Figure 2: DFO regions: Newfoundland and Labrador, Maritimes, Gulf, Québec, National Capital, Central and Arctic, Pacific

Creation of the Council of Fisheries and Oceans Librarians
At the 1980 meetings, the managers of the DFO libraries came to the realization that the senior DFO librarians had to meet regularly to discuss common problems and to share experiences. In addition, they realized that if the libraries were to be able to respond to departmental initiatives with a common voice or to petition the department in support of future activities that some sort of formal organization was required. Finally, they realized that such a formal structure could not be based on a centralized departmental structure.

The formal terms of reference for the Council of Fisheries and Oceans Librarians included the following points
   Purpose
   - to provide a forum for discussion of matters which are of mutual concern…
   - to provide a vehicle for collective action …
   - to provide endorsement for cooperation …

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- to investigate and discuss new techniques and systems with an aim to improving libraries in the entire department
- to make recommendations … to … managers on matters affecting libraries in the entire department

Composition

- Council composed of one representative from each DFO library [normally the manager]
- Chairperson to be elected by a majority of the Council. Term of office to be one year

Meetings

- at least one meeting a year…

In addition to the formal terms of reference, several other practices were adopted early on:

- meetings would rotate through the various DFO library worksites
- decisions would be made by consensus
- activities would be conducted on a cooperative basis – each library and member of Council would contribute as time and resources permitted

Most of COFOL's activities are conducted between meetings by a series of standing or ad-hoc committees. The 2006/2007 committees are concerned with

- WAVES database (5 members)
- DFO virtual library (5 members)
- Digitization standards (4 members)
- Electronic subscriptions (5 members)
- DFO library statistics (5 members)

CHANGES TO COFOL SINCE 1980

The composition of COFOL has changed a good deal since 1980. The Library of the Arctic Biological Station library and two Pacific coast libraries were closed and the collections were dispersed. The Halifax and Dartmouth libraries have been consolidated at the Bedford Institute of Oceanography. The Quebec library moved to the Institut Maurice-Lamontage, at Mont-Joli, on the south shore of the St. Lawrence River. A new library opened at Moncton, New Brunswick, to serve the new DFO Gulf Region. In the early 1990's the Canadian Coast Guard became part of DFO and the Canadian Coast Guard College Library at Sydney, Nova Scotia and the Fleet Technical Library at Ottawa joined the DFO library community. The Fleet Technical Library subsequently merged with the larger, older Ottawa library that serves DFO's National Capital Region.

In the mid 1980's, again in the mid 1990's and most recently in the early years of the 21st century, DFO went through a series of restructuring (i.e. downsizing) exercises. In addition to the closure of libraries mentioned earlier, the libraries lost staff and some

financial resources.   There also have been some organization changes. In the Maritimes, management of all the region's libraries was consolidated.

Figure 3: 1987 COFOL meeting, National Capital Region, Ottawa, ON

Figure 4: 2006 COFOL meeting, Bedford Institute Oceanography, Dartmouth, NS

COFOL ACCOMPLISHMENTS

COFOL's major accomplishment over the past 25 years has been transformation of a series of independent libraries into an active nation-wide library network that provides a series of national library programs to DFO. An account of our initial successes can be found in Betty Sutherland's presentation at the 12th IAMSLIC conference in 1986.

The *WAVES/VAGUES* program has been at the core of most of COFOL's activities since its inception in the 1982. (see Olson, Fiander, Cameron, Conroy & Lalande 2000 for a detailed narrative outlining its evolution). *WAVES/VAGUES* provides the information on which COFOL can share collection resources. It serves as a bibliography of DFO publications, and provides the links to electronic DFO documents. It also provides the links to those electronic subscriptions to which DFO staff have desktop access.

WAVES/VAGUES is an integrated library system with web based public access as well as cataloguing, serials control and circulation modules. It is based on the principle that there will be only one bibliographic record for each document. Any library may create this core bibliographic record and it is shared by all libraries that hold that document. In addition, any library that holds the document may modify or enhance the core record. Any number of copy records can be added to the core bibliographic record to reflect the unique shelving requirements of the individual libraries. Finally, *WAVES/VAGUES* has some unique thesaurus features. Species names, corporate names and corporate series are authority-controlled.

WAVES/VAGUES also provides a great example of how COFOL works. The financial resources that are required to maintain the database and the BASIS TechLib software are provided by the National Capital Region (Ottawa) library. The WAVES database manager also is provided by the Ottawa library. Cataloguing standards, cataloguing policies and procedures are developed by the WAVES committee which consists of librarians from several DFO libraries. Bibliographic and copy records for the *WAVES/VAGUES* are created, and modified by cataloguers from all the DFO libraries. For some monographic series, individual libraries have made formal *cooperative cataloguing agreements* in which they agree to catalogue all current items of a particular series on behalf of the network. In addition, the thesaurus files for the authority controlled fields are maintained by volunteer coordinators.

More recent accomplishments include the initiation of a digital archive for DFO documents, and the implementation of department wide desktop to electronic journals. The digital archive project is an extension of an early COFOL initiative to collect and preserve DFO's publications. Electronic editions of DFO documents are stored on the COFOL server and are linked to the catalogue record in the *WAVES/VAGUES* database. These documents are collected from the publishers by the regional libraries and are submitted to the WAVES database manager for archiving. COFOL has been acquiring subscriptions to electronic journals for several years on a somewhat ad-hoc basis, as we waited for the implementation of a national program by a consortium of Canadian

government agencies. In 2005 COFOL decided that the DFO libraries could wait no longer, and the Electronic subscriptions committee negotiated nation-wide desktop access to titles within the ScienceDirect and SpringerLink systems. The subscriptions were paid for by contributions from each DFO libraries regular budget. This is another example of sharing and cooperation that characterizes COFOL.

Another example of the cooperation and shared responsibility is COFOL's approach to collection development. Each library is a *Primary resource centre* for legacy print materials and agrees to maintain these materials on behalf of the network.

Figure 5: a WAVES record

CHALLENGES FOR COFOL

Financial resources. The budgets of for DFO libraries have not kept up to the demands for a quality up-to-date service. Our ability to support existing electronic subscriptions in 2007 and beyond is in question. Our ability to maintain our obligations to Aquatic Science and Fisheries Information System (ASFA) also is questionable, as is our ability to pay for software upgrades and system maintenance for *WAVES/VAGUES*.

Beginning in 2003, COFOL has been preparing briefs for senior DFO management, outlining our requirements for additional funds. At present, a COFOL committee is working on a business case that includes a detailed rationale for additional financial support.

WAVES/VAGUES. Presently, our catalogue database is not compatible with the Z39.50 protocols. Consequently, *WAVES/VAGUES* records do not appear in mega catalogues such as the IAMSLIC Distributed Library.   In addition, software for non Z39.50 integrated library systems is limited. COFOL may have to consider converting its database to a Z39.50 compliant format.

Libraries and Information Management.   Throughout the past 25 years, DFO library staff has been involved in a wide variety of non-traditional activities including: report publishing, editing, publication distribution, data archiving, records management, and website development.   Many of these activities are now characterized as Information Management and agencies have developed new structures, policies and procedures to deal with these issues.   Within DFO, the libraries are working to have their skilled and experienced staff to become directly involved in general planning and coordination of Information Management activities.

Organizational change.   Recently, senior DFO managers have come to the realization that COFOL and the DFO library network do not fit into traditional hierarchical organization models. The library network is a national program yet the management of the program is in the hands of DFO staff without formal national responsibilities.   This awareness may in part be a result of COFOL's recent efforts to obtain additional resources and to have direct involvement in DFO Information Management.   Regional DFO managers, particularly those in the Science sector, remain reluctant to relinquish control of local libraries.   A COFOL committee is working with senior members of DFO Information Management group to develop a management structure that will recognize both the regional and national roles of COFOL and DFO libraries.

AFTERWORD

COFOL provides an example of how a group of librarians without formal organization support, have been able to establish an active and effective library network. The COFOL model, based on cooperation, sharing, consensus and distributed participation, may prove to be one that other groups of libraries could adopt.

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NOAA FISHERIES LIBRARY CONSORTIUM (NFLC): PROJECT OVERVIEW, PROCESS AND OUTCOMES

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Project Overview:

The libraries of the National Marine Fisheries Service (NMFS, also known as NOAA Fisheries) comprise nearly half of the libraries serving the National Oceanic and Atmospheric Administration (NOAA). These libraries are distributed around the United States with 16 libraries in 11 states (Figure 1).

The NOAA Fisheries Library Consortium (NFLC) was formed in 2004 in order to fulfill a directive by the NOAA Fisheries Science Board to review existing library services and to make recommendations for improvement throughout the agency.

Figure 1 – Distribution of NOAA Fisheries Libraries

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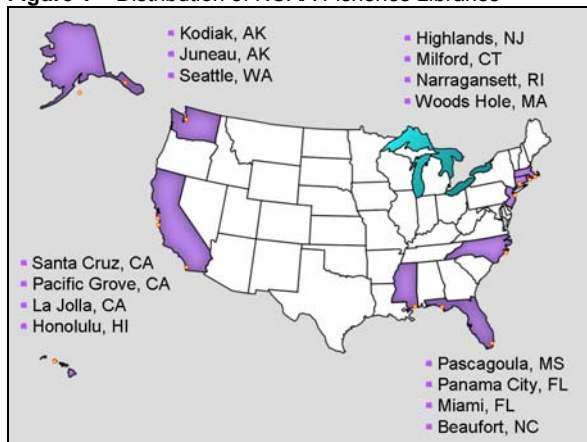
The NOAA Fisheries libraries began discussing the project in mid-2004. E-mail and conference calls were used to communicate and prepare for the initial meeting in October 2004. Agency support for the project included Science Board mentorship, travel support, and funding a professional facilitator.

The first meeting of the NFLC took place October 2004 at NOAA Headquarters in Silver Spring, Maryland. A work plan was developed and committees were formed to complete a needs and capabilities assessment, develop recommendations, and plan for implementation. Committee reports were finalized and collected into the final project report which was presented to the Science Board in February 2006. The primary recommendations of the NFLC report were:

1. The NFLC be accepted as a standing advisory group on library issues for NOAA Fisheries.
2. Agency-wide electronic resources should be centrally funded.
3. A new full-time librarian be hired to negotiate and manage these resources.

These recommendations were accepted in principle by the NMFS Science Board. The NFLC continues to meet and work toward implementation of the report recommendations, while waiting for the funding necessary to fully put them into action. The timeline in Figure 2 illustrates the development of the NFLC and completion of various project elements.

Figure 2 – NOAA Fisheries Library Consortium timeline

May 2004	Approval from NMFS Science Board
Oct 2004	Initial meeting and creation of NFLC
	Data collection and analysis
May 2005	
	Recommendations
July 2005	
	Implementation plan
Oct 2005	
	Final report compilation and review
Feb 2006	Presentation to Science Board
???	Action by NMFS management
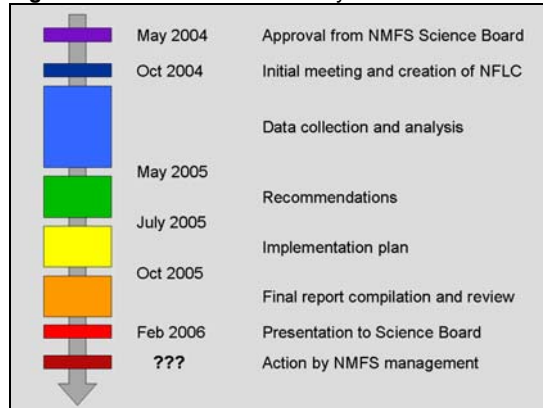
Process:

Effective communication within the NOAA Fisheries Library Consortium was extremely important to the successful completion of the project. Working with a professional

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facilitator in the initial phase focused the group's efforts helped develop the work plan and project timeline. E-mail and conference calls were convenient and cost-effective ways for the group to communicate after the initial meeting, and they continue to be used as the primary means of communication. NFLC progress was communicated to the Science Board through our mentor, and to other NOAA Libraries at annual meetings.

The NFLC web page (http://swfsc.noaa.gov/nflc/) provides information on the project and access to finalized NFLC documents. During the initial project, a separate document depository was maintained for group access to draft documents under review.

NFLC libraries were surveyed on key elements of library services for the needs and capabilities assessment. Data was collected on core print and electronic resources, cataloging, facilities, budget, staffing, equipment, and collection value. Data was compiled and analyzed in a Microsoft Access database. The results were reported in the NFLC needs and capabilities assessment, which served as the basis for our recommendations and implementation plan. Individual committee reports were reviewed by the entire group, then compiled into a final report including an executive summary.

Outcomes:

The formation of the NOAA Fisheries Library Consortium has strengthened cooperation and communication among NMFS Librarians. The needs assessment project highlighted existing strengths and enabled the group to formulate a plan for improving agency-wide library services. The final project report accepted by the NMFS Science Board in February 2006 provides a roadmap for the NFLC to move forward with the implementation of our recommendations.

Additional information on the NOAA Fisheries Library Consortium including the final project report is available on the NFLC website at: http://swfsc.noaa.gov/nflc/

OUTREACH PROGRAM AT THE SCRIPPS INSTITUTION OF OCEANOGRAPHY LIBRARY: TARGETING FACULTY, RESEARCHERS, AND STUDENTS

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ABSTRACT: With the proliferation of electronic resources and the demands on researchers' time, desktop delivery of information has become even more essential to our clientele. The geography of the Scripps Institution of Oceanography, in addition to this dependence on desktop delivery, and remote access to library resources and services, has shifted library clientele almost entirely from on site actual users to off site virtual users.

To assure that these remote users are finding and accessing all relevant resources for their research and instruction, the library developed a detailed outreach program to target faculty, researchers and graduate students.

To increase graduate students' attendance at library orientation classes and tailored one-on-one consultations, incentives in the form of $10 and $20 gift certificates to the coffee stand adjacent to the library were offered. An added incentive that further increased graduate attendance at classes and consultations was the raffling of iPODs to attendees. Undergraduate students were invited to the library by using advertising in campus publications, and signs in other, more crowded branch libraries.

As part of this outreach program, Scripps faculty and researchers are contacted, department-by-department, with phone calls to their offices, a systematic "cold calling" program. The goal of the "cold calling" was to contact each academic to ascertain if their informational needs were being met and if they were informed about the latest databases and electronic resources the library offered in their subject disciplines, and to offer consultations, individual or group sessions, in their offices or laboratories.

Success of the outreach program is being measured by increase in library gate-count, attendance at classes and consultations, and initial contact to all current academics at SIO.

KEYWORDS: Library outreach programs; library instruction; consulting services; marketing.

Introduction & Background

The Scripps Institution of Oceanography is over 1 mile west of the main University of California, San Diego (UCSD) campus. The Scripps campus is fairly large with departments spread out all around this western area, with some structures built into the hill-side, up at the top of a steep hill, and down right on the beach and around the Scripps Pier. There are also some more remote departments in Point Loma, over 10 miles south of the campus, by the SPAWAR and submarine facilities.

Thus, Scripps researchers and graduate students could be all over the campus, at home, visiting other institutions, visiting other countries, collaborating with other researchers, on sabbatical, literally all over the world conducting research.

Our Main Objective

Being a part of a spread out campus, with faculty, researchers, and graduate students all over the Scripps hillside, and possibly the world, our main objective is to provide our resources (databases, electronic journals, reference works) and services (desk top delivery of print items, reference assistance) where and when they are needed most.

The Challenge

With the increasing demands on researchers' time, and the proliferation of electronic resources, we have found that the demand for desk-top delivery of information has caused a drop in the library gate-count. In the recent past, around 3-4 years ago, there was a consistent decrease in people visiting the library.

Most of the buildings at Scripps have great views, in addition to being spread out over the area hillside, so faculty, staff, and students are not motivated to leave their offices/labs to use the library given that they can access most journals electronically. Undergraduate students on the main campus are generally unaware of the Scripps Library, which is a short campus shuttle ride away.

Outreach Goals

Our outreach goals were very basic. For the graduate students our goal was to provide incentives to increase attendance at consultations and classes, and to imprint the outreach librarian on them as their library contact person.

For the undergraduate students our goal was to promote the library as a quiet (with nice views of course), accessible place to study, since most of them are unaware that it exists in its off-campus beach location.

For the Faculty & Researchers our goal was to have a systematic plan to contact every current academic in all Scripps departments and imprint the outreach librarian on them as their library contact person.

Outreach Plan

To have a systematic approach to academic and graduate student outreach, a detailed plan was drafted by the outreach librarian and the library director.

After following the plan for several months, experience gained led to revisions to adjust the workload, such as the number of people targeted each week, and to document time spent, and define the measure of success in meeting the goal. We kept track of time spent to demonstrate to the busy outreach librarian that the time consumed in achieving the modest mutually-agreed goals was not an inordinate or unreasonable call on the librarian's time, and to heighten the librarian's awareness of the importance of balancing outreach work with other calls on the librarian's time.

The plan was put in place to outline outreach efforts to graduate students, such as offering them incentives to take the time to attend consultations and/or classes and distributing of promotional items such as pens and gift certificates.

The plan also detailed the systematic contact of faculty and research academics by making phone calls to their offices to offer them library instruction and consultation.

A year later, outreach efforts to undergraduate students were added to the plan.

Outreach to Graduate Students

Graduate students in their first year were specifically targeted. The Outreach Librarian was invited to speak at the general orientation for the new first year graduate students, the week before classes started. This entailed only a 10 minute time-slot in a busy afternoon schedule filled with different faculty members and graduate advisors presenting about programs, services, and what to expect in the next few years.

During this orientation day the graduate students were being bombarded with information and would remember very little, so the librarian resorted to doing a very brief presentation about the library website, where to find listings of resources and services, distributed promotional pens and magnets (fig. 1), and then invited the graduate students to drop by the library for classes during orientation week and the first week of the quarter, or to sign up for individualized consultations.

To entice the first year graduate students to attend the library orientation classes or schedule consultations, gift certificates to the coffee & snack bar adjacent to the library were offered.

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Fig. 1 – Promotional magnets

These gift certificates were very popular. The Cups coffee shop is conveniently located adjacent to the library, a nice redwood deck with a great view and wireless access, offering coffee, juices, lunch salads and sandwiches, and snacks. Students are invited to bring their food & drinks into the library.

For attending the drop-in 30 minute library orientation class, a $10 gift certificate was offered. A $20 gift certificate was awarded to those students scheduling and attending one hour, one-on-one, individualized consultation sessions with the outreach librarian. The Library places a higher value on individual instruction, where more time can be spent on specialized databases depending on the student's focus areas, so individualized consultations were awarded the higher value certificate. For example BIOSIS database searching is covered in depth for Marine Biology students, while the GeoRef database is covered for the Geosciences students, the Meteorological and Geoastrophysical Abstracts database for the Climate Sciences students, and the INSPEC database for the Physical Oceanography students.

The purpose of the gift certificates was to imprint the outreach librarian service on them, and there is no penalty, or expiration date, if they don't take advantage of the service during their first year. To increase attendance during their first year by offering an even bigger incentive in Fall 2005, 4 iPOD Shuffles were promised as prizes in a raffle. To enter this raffle a graduate student would need to attend a library class or consultation session. Then, in Fall 2006 the raffle prizes promised were upgraded to 3 iPOD Nanos.

This graduate student outreach program has undergone fine-tuning since initiation, in order to increase the percentage of students participating in their first year. Overall the program has been very successful, especially considering the fact that all the library classes and consultations have not been part of the students' curriculum, rather by their own choice and attended on their own time. So reaching around half of these graduate classes in 2003 and 2004 was pretty successful, and reaching over 75% of them last year was awesome.

The consultation sessions are requested and scheduled over the whole academic year, not only in early fall, and the drawing of names for the iPOD prizes is in Spring. Attendance is improved by sending the students an email reminder about the consultations, gift

certificates, and iPOD raffle, especially right before the Winter Quarter holiday break and the Spring Quarter break. These emails generated several responses, and consultation sessions, from students who were in town and not over-committed with attending classes.

Measuring Success – Graduate Students

In 2003 there was relatively low attendance at classes, and fairly good attendance at consultations, probably due to the $20 gift certificate (instead of $10), and due to the consultations being more tailored to their needs, scheduled at times that would be more convenient for them, and offered during all 3 quarters.

In 2004, 50% attended classes or consults, and there was a marked increase in class attendance due to more classes (10 drop-in sessions instead of 5) offered during the week before formal instruction began.

In 2005, 76% attended classes or consultation sessions. This 25% increase was due to several factors: sending out a number of email reminders, scheduling 5 additional drop-in classes, and having a raffle with the possibility of winning one of 4 iPOD Shuffles.

In 2006, 21 classes were scheduled, and the raffle prizes offered are 3 iPOD Nanos. The reason we offer classes, while we value the one-on-one consults, is that some of the shyer students prefer the classes.

Outreach to Undergraduate Students

Why did we decide to include undergraduate students, since Scripps is a graduate research institution?
- Because of the increase in undergraduate enrollment at UCSD and the UCSD Libraries targeting undergraduates in their outreach efforts.
- Plus the upper campus library branches were filled to capacity while we had seats to spare.

How did we reach out to the undergraduate students?

By using our quiet, and attractive beach front location as a draw, and putting that on posters and in eye catching campus newspaper ads and student publications

Advertising

Initially, around 3 years ago, the Scripps Library advertisements placed in the campus newspaper were quite plain and cluttered with words, the plain text look was definitely not that eye-catching.

Starting in Spring 2005, a more colorful ad (fig. 2) was designed, larger ad space was purchased (quarter page), and timing was before final exams. In the following quarters

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the ad size was reduced a little, but color was maintained, and an additional ad placed a little earlier in the quarter.

Fig. 2 – Ad in campus newspaper

Plans are to keep placing ads in the campus newspaper, several times a quarter, and other student publications such as the new freshmen's "Student Survival Guide".
In addition to the ads in the campus newspaper, publications, and UCSD Libraries newsletter, signs were designed (fig. 3) and posted in other library branches, and the campus student center food court around finals week.
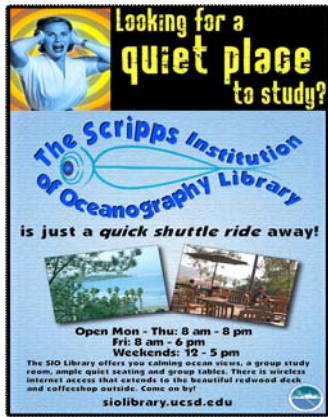
Fig. 3 – Signs posted around campus

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To increase the welcoming atmosphere in the library during finals week, refreshments and a "good luck with finals" sign were placed on a table by the library entrance.

Measuring Success – Undergraduate Students

A very good, though anecdotal, measurement of the success of promoting the library with ads in newspapers and posting signs, was the noticeable increase in undergraduate students using the library.

Outreach Budget

There certainly is a cost for all of this outreach: the gifts, and the promotion of the library in various publications. An annual outreach budget was put in place, and revised for 2006/07 to reflect the cost of more frequent newspaper advertising, upgrading to new generation of iPods and refreshments during each quarter's finals week.
Sample outreach budget:

Outreach Budgetary Plan: $3,800

Cups gift certificates for new Grads	$ 750
Cups gift certificates for prospective Grads	$ 375
iPODs for raffle (3 Nano types	$ 450
Magnets/pens PR freebies	$ 600
2 Color Guardian ads Fall Quarter	$ 496
1 Black & White ad Fall Quarter	$ 98
1 Color Guardian ad Winter Quarter	$ 248
2 Black & White ads Winter Quarter	$ 196
1 Color Guardian ad Spring Quarter	$ 248
1 Black & White ad Spring Quarter	$ 98
Signs promoting library	$ 50
Refreshments for finals week	$ 225
Total	**$ 3,834**

Outreach to Academics

The goal of this outreach program was to contact each academic, department by department, to introduce the outreach librarian, and to ascertain if their informational needs were being met.

Methodology entailed compiling lists of current academics in each department. The plan for the first round of outreach avoided contact of postdoctoral scholars, visiting scholars, adjunct professors, or emeritus faculty. Outreach to these other academic populations was put off until the longer-term active and permanent academic population was addressed. Priorities had to be set. The target list contained names of current faculty members and researchers- research assistants, specialists, lecturers, and project scientists.

After the first round was accomplished, with all current Scripps academics in all departments contacted, the new post-docs and visiting scholars are contacted around the time they are appointed.

After the list of academics is compiled the outreach librarian searches departmental and individual websites to ascertain their areas of research and publications.

Several specialized databases are searched for each academic's publications. Routinely 4-5 databases are searched for each academic, and depending on their research focus more specialized databases may be consulted. For example, searches of the Aquatic Biology Aquaculture & Fisheries Resources, BIOSIS and Zoological Record databases for the marine biologists; SciFinder Scholar (Chemical Abstracts) for academics in climate chemistry or chemical oceanography, INSPEC for those in physical oceanography and geophysics.

Then the list of academics is annotated to include the search results for all databases in their areas of research, the top 3 databases, where most of their publications are indexed, are the ones mentioned during the phone conversation.

Cold Calling

After compiling and annotating the list of each department's Academics, the phone calls, "cold calling", proceed following a prepared script.

Cold Call dates and responses are noted on the list of academics to facilitate keeping track of contacts and to follow up in a few days for those not contacted during the first call. Detailed messages with librarian contact information are left with the academic's voicemail service.

If not contacted after 3 phone calls, a follow-up email message is sent detailing the consultation offer, a listing of databases relevant to the specific academic's research areas and mentioning important library services, such as document delivery and current awareness alerting services.

Recently, sending out confirmation email messages were added to the outreach plan. These email messages are sent as follow up to academics contacted by phone, to assure that the librarian's contact information was available to them when they need it.

Armed with the list of academics, their research areas, and appropriate databases for their topics, the outreach librarian follows a prepared checklist type of script (fig. 4) for the cold calls.

The reasoning behind this was that by asking a series of specific questions about their awareness of databases in their field, electronic resources and services that the library

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offered, the librarian verified if the academics knew as much about library resources and services as they might think they do.

Script & Checklist for Cold Calls:

Good morning/afternoon Prof/Dr._____. This is Amy Butros, I am the Outreach & Instruction Librarian at the SIO Library. I am calling to introduce myself, give you my email & phone # in case you have any questions about our library resources and services, or if you'd like an **individual or group demo** of any of our resources or services.

Links to all of these resources, and a description of our services, are available from our **Website** at: **http://siolibrary.ucsd.edu**

- List of Relevant **Databases** (right side of website) and key databases at SIO, for your subject areas, we would recommend the following databases* _____
- Access to **Electronic Journals**: via **ROGER** – or browsing via the Electronic Journals list (under Resources & Collections)
- Getting copies of articles – **Avanti** for items we own, but not available electronically. – ILL forms for items we do not own, best place to find is via the **Contact Us** page on our website
- Use **UC-eLinks** from most of the databases to find full text of article, or to **Request** items
- For convenient email updates of search topics (**Alerts**) from databases such as BIOSIS, GeoRef, Web of Science, and Zoological Abstracts

Fig. 4 – Checklist used for phone calls to academics

Outreach Results

The immediate benefit of these "cold calls" was that several academics asked specific questions in response to the series of topics, resources and services covered, and the outreach librarian resolved their access or searching problems during the telephone conversation.
The academics' thanks and positive reception to library services and resources was very rewarding and encouraging to hear.

Some "cold calls" resulted in the scheduling of individual consultations with the academics, mainly held in their offices, to assist them with database searching, online requesting of documents, access to electronic journals, and bibliographic software program use (EndNote).

At minimum all contacted academics now have imprinted the name of the outreach librarian for any future questions they may have. Imprinting the outreach librarian has proved to be important in our environment of remotely accessed resources and services. Even when a consultation offer is declined, subsequent announcements to the Scripps

community of new resources or services have resulted in queries for assistance from the outreach librarian.

Anecdote: a faculty member sent a question about remote access this past January, 2006, as a 'reply to' the outreach email message, which was sent to him in January 2005 - a year before the need! The academic kept that library contact email for future referral and use.

Measuring Success – Academics

The performance of the outreach librarian in cold calling academics is measured by the number of first-contact cold calls placed in a time period set by agreement with the supervisor. Follow-up procedures are in place when no contact is made that first time. The goal for the number of first-contact phone calls to be placed within a set time period can be modest since the target population isn't that large. This workload is spread out over many months, since there seems little need to cycle through the entire academic population within a relatively short period of time. Therefore this outreach effort is modest and can be integrated into the outreach librarian's overall workload. Making the service available, as measured by the first contact call, is perhaps the best measure of performance for the outreach librarian, since everything occurring after that is not within the control of the outreach librarian. Certainly whether or not an academic wishes to discuss library resources and services at length on the phone or in personal consultation should not be a performance measure (or measure of success for the program) for the outreach librarian. An academic declining phone or in-person consultation is at minimum made aware that someone is available for their information consultation needs. A follow-up request for assistance on their own initiative or a renewed contact in a few years by the outreach librarian may result in individual consultations.

A great "side-effect" of the amount of time spent researching resources and searching specialized databases was that the outreach librarian's knowledge and expertise were strengthened and expanded.

A very positive result of leaving the librarian contact information with the academics in different departments, is that new hires, staff and research assistants, have contacted the librarian stating that they were told to call her to set up a consultation to be introduced to the library resources and services.

After 3 years of cold calling Scripps academics, all of the departments have been contacted. This first round of phone calls and emails was completed in July 2006.

The first round focus was placed on current, permanent, academics, that would be faculty and researchers, not targeting emeriti, visiting scholars, or post-docs, the target audience was 227, not the full Scripps academic population of around 390.

Since we are measuring success by the number of academics contacted by these "cold calls", and not by the number of academics who participated in consultations, our

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significant achievement is that 49% (fig. 5) of all current academics were reached by phone calls. It can be difficult to reach scientists via telephone. While we do follow up with emails for those we cannot reach via telephone, we consider reaching half of them with a highly personalized telephone conversation to be a significant achievement.

This 14% does not include all consultations or requests for help that the librarian receives routinely (the graduate students, new faculty, emails and calls with questions, etc.), only those initiated by the outreach librarian through the "cold calling" program.
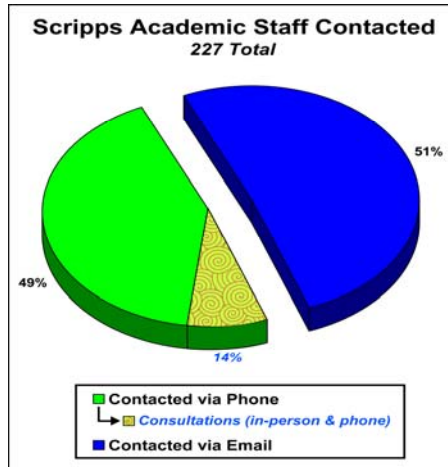
Fig. 5 – Percentage of Academics contacted

Future Plans

Contact all academics not reached by phone in the first round of "cold calling", starting with the first department contacted.

Contact academics who reacted positively to the offer of a group demonstration of databases or resources.

Target newly appointed post-docs and visiting scholars listed in the quarterly list of academics distributed by Scripps academic personnel office.

We have a plan in place to offer specific classes where need was observed, e.g. EndNote and any new database interface (e.g. Zoological Record, multi-database searching, etc.).

Investigate and discuss ways to follow up with those who participated in consultations, and classes, to assess learning and explore any future or continued needs.

Contact Management Database

The plan for organizing and automating data collection & retrieval entailed selecting an appropriate database. After using Excel for the first few entries, the librarian decided to look for a database that was designed specifically to manage client type contacts. One of the most powerful and widely used databases for contact management was "Act". Act was a bit too complex for the library's needs, it was designed for big companies and for sharing of large amounts of data over networks. A more basic, and easier to use, program was Time and Chaos' Contact Management database. It was easy to train a staff member to assist the librarian with data input into this program; the only drawback is that it does not interface with the email system the UCSD libraries currently use. As it turned out the email interface for appointment scheduling was not as important as having the data available to check on academics already contacted and to follow up on notes taken during conversations with the academics.

Conclusion: Lessons Learned

A few key things learned while trying out these different outreach strategies on the students and researchers:

For the undergraduate students, using eye catching and relevant enticements – changing the newspaper ad, including information on parking, and feeding them.

For the graduate students: having a major enticement, like the iPODs, definitely helped, but also reminding them frequently by email, and bonding with them at their social events, such as the "Pizza on the Pier" welcome party.

For the faculty and researchers: sending them an email message with the librarian contact information, after the phone conversation, helped to ensure they have the information when they need it, and changing the offer of a class, or instruction, or help – to a "demonstration" of database features and shortcuts was a lot more effective.

HISTCOMP : BIBLIOGRAPHIC ANALYSIS AND VISUALIZATION OF THE "BIOLOGICAL BULLETIN"

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Abstract
A collection of citation data, the HistComp, is available from the Internet as a database of examples of real life citation networks. The purposes of this approach is the analysis of these citation networks on learned literature by presenting its typical steps and results. We have selected the bibliographic insights into the "The Biological Bulletin", the journal published since 1897 by the Woods Hole Marine Biological Laboratory. Since the bibliographic networks tend to be very scattered, their visualization requires of criteria of convergence. To simplify, the main features in such a structure should include the survey for authoritative sources in the hyperlinked environment and the identification of thematic areas. By avoiding excessive loose connections and too dense clustered layouts to be useful, a smooth presentation is obtained by graphically depicting the citation patterns. HistComp computes 8884 articles published by 'The Biological Bulletin' between 1945-2003. A two-dimensional positioning of these papers that represent the extent of their bibliographic coupling and co-citation is offered as a histograph. The criteria to construct it is the adequateness of the visualization relative to the 8884 data set. The spatial representation obtained optimizes the identification of the clusters or topic areas. The thematic importance of marine science involves its participation in 7 of the 7 presenting clusters. The mainstream subjects were crustaceans and echinoderms, with some 60% of the material presented in the graph. But sea anemone, with about 16% of the total, remains as the best visualized topical area. A perspective of the highly relevant papers is readily confirmed by the visual inspection of width of the glyphs used for nodes representation. For user interaction, HistComp employs mouse-over labels.

Introduction.-
The basis in this study will be a total of 8884 'The Biological Bulletin' papers from 1945 to 2003, including full reference lists and citation counts to each paper by August 27, 2003.

The *Bulletin* was established in 1897, it is now in its 208th volume, and it is among the oldest peer-reviewed biological publications in the United States. The *Bulletin* is also

among the most precious assets of its publisher, the Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts. The MBL is America's oldest private marine laboratory. (Greenberg MJ, 1999)

The initial software for the automatic generation of historical or genealogical maps of papers or topics by processing the export files of source records extracted from SCI was called "histcomp". And an index of HistCite analysis is available under a directory with this initial name "histcomp" (http://garfield.library.upenn.edu/histcomp/) and this bibliomining technique has its own bibliography of papers (http://garfield.library.upenn.edu/algorithmichistoriographyhistcite.html). The software "histcomp" was referred at the Lazerow Lecture to honor the memory of Professor Casimir Borkowski in September 19, 2001, at the University of Pittsburgh.

Nowadays histcomp has evolved into the HistCite^{TM} software. This is a system for the historiographic analysis that organizes the bibliographic collections generated by searching in the Science Citation Index of the Web of Science (WOS) or in the SCI-CD-Rom. It permits to follow the evolution of articles, authors, and journals and the graphical representation of the more influential articles on a subject chronology. On November 18, 2002, this program presented at the 65th annual conference of the American Society for Information Science & Technology (ASIST) along the bibliometrics session. The authors were E. Garfield (emeritus president of Thomson ISI), A.I. Pudovkin (biologist at the Institute of Marine Biology, Vladivostok) and V.S. Istomin (formerly at Washington State University, now in Vladivostok). The present contribution is based in its 2005 version.

The need of reference librarians and users to improve the results of their searches in databases like SCI, Medline or Chemical Abstracts are well-satisfied by using the "histcomp". The resulting visualization provide a fairly comprehensive snapshot of the "Biological Bulletin". (Boyack KW, 2004)

Methods.-
All the references for the 'Biological Bulletin' have been downloaded from the ISI Web of Knowledge, between 1945 and 2003, by using the expression 'SO = (Biological Bulletin)'. With the software HistCite^{TM} (2005 version) this set of papers has been graphically represented in a citation network.

The histcomp for the "Biological Bulletin" has been accessed (http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/). The main presentation provides sort results by node, author and citation counts. The frequency analysis of author (see Table 1) and journal (not reproduced here because in this case it is limited to the only *Bulletin*, available from: http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/hist-jns.html) provided by histcomp is exposed.

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Ranked All-Author list.
Total: 8949
Sorted by **pubs**

#	Name	TGCS	TLCS	Pubs
1	Atema J	612	122	68
2	Inoue S	221	17	63
3	BROWN FA	782	135	56
4	Valiela I	127	16	53
5	Zigman S	70	13	53
6	Barlow RB	228	41	51
7	STUNKARD HW	471	82	51
8	KOIDE SS	108	11	47
9	METZ CB	310	39	45
10	Armstrong PB	75	15	43

Table 1.- Sequence of the 10 first authors in bibliography on 'The Biological Bulletin', sorted after the number of articles by the authors in this journal. Clicking on the hot linked number under Pubs shows a list of the articles by author.
http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/hist-aus-pubs.html

This is supplemented with some data as supplied by HistCite™ (2005 version) concerning the country, document type, institutions, publication year, subject category, and word frequency.

The identity of the core literature is examined by considering the selection threshold used to produce the graph 'LCS > 12', and by implementing the outer references frequency ranked tables and the missing link tables. A combination of both tables will serve to improve the retrieved original information collection.

The citation matrix that histcomp manages permits the elucidation of the line forces guiding the elaboration of the flow chart. It can be used to visualize the co-citations.

Characterization of the '*Biological Bulletin*' between 1945 and 2003. Basic analysis.
The '*Biological Bulletin*' authorship geographic distribution spreads over 62 countries. This journal publishes articles (54%), meeting abstracts (44%), and other kind of editorial material (1%), notes, reviews and letters. After the available data (57.3% of the records do not contain data in this field) some 1034 different institutions are involved with getting published by the journal, and the three first European universities are those from Palermo (Italy), Basel (Switzerland) and Barcelona (Spain). The maximum number of annually published distinct record material was 242 in 1960. This journal is purposely

committed 100% with marine & freshwater biology. Some 9042 different authors see their material introduced to the topical structure of the discipline through the pages of the "Biological Bulletin". These are data provided by WOK after its option 'Analyze results' that view rankings and histograms of the authors, journals, etc for each of the retrieved set of records; the data have been checked after the same rankings and histograms as supplied by HistCite[TM].

The '*Biological Bulletin*' after the histograph.-
Histcomp works on the basis of the model of circles (see the graph at http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/graph/1.html, and a fragment at Table 2). The area of each circle is proportional to the number of articles that cites to the one pointed out with a number inside the circle. With the help of a list of authors, "Ranked all-author list" (see, Table 1) and ordered by TLCS (total local citation score), we have a criterion of local citation to the collection. This is the first perspective of the highly relevant papers in the "*Bulletin*". A visual inspection of the width of the glyphs used for nodes representation readily confirms it. For user interaction, histcomp employs mouse-over labels.

The LCS is the local citation frequency inside the collection. It is particularly suited in this case because the graph proposed considers a selection threshold 'LCS>12'. It means that all the articles that display 12 or more citing articles inside the "*Bulletin*" are shown in the graph. Histcomp also works with another type of frequency, the global citation frequency (GCS), GCS, is the global citation score based on the ISI Web of Science (WOK) database record.

The problem of discernment of the citation cycle that exist inside the bibliography displays a first insight depicting the activities of Dr CM Williams from 1946 to 1968 and, Dr DM Skinner from 1962 to 1972. A solid line links node #4208 to node #78. Although virtually absent nowadays, insects are the scope of the published material by Williams and crustaceans were the marine invertebrates reported by Skinner. The common focus of both scientists was the endocrine system.

The second citation cycle (see Table 2) provides a graphical patron for the identification of critical works regarding the topic 'sea anemone'. To aid in the recognition of appropriate evidence, the graphical interface permits the visualization of the particular records corresponding to each node. As extracted after the graph, it is clearly visible from the records that two dissertations (ROBERTS BJ, 1941, THESIS STANFORD U) and (BUCHSBAUM V, 1968, THESIS STANFORD U) are the basis for the work of the papers authored by Dr L Francis, which is the original contributor on the subject. So the first level document tipology is composed by each of the papers considered in the graph. The second level provides the references that constitute the bibliographies of each of this papers. By using the more recent HistCiteTM the reference librarian can obtain a graphical view limited to the topic 'sea anemone', understanding the history of the research question.

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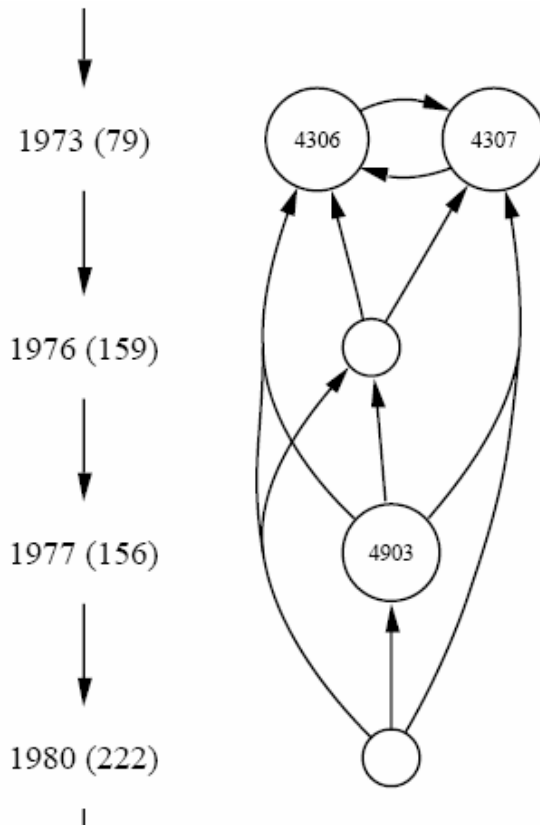
Table 2.- 'The Biological Bulletin' second citation cycle, provided by its graph when the number of citing nodes inside the journal is over 12 (LCS > 12). It describes the topic 'sea anemone'. The circle represent papers, and the number inside the circle is the node number. http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/graph/1.html

The remaining five clusters are indicative of simple hierarchical choices limited to the visual exploration of a couple of cited/citing papers. So graphically the depicted relation is simple. Although when the second level document topology is used it becomes possible to present the extensive ramification of the continuous flow of contributions inside '*The Biological Bulletin*' that communicate with the original paper on the topic and through bibliographical coupling. In these five cases a topic structure has been derived by matching of the provided 'histcomp' with 'HistCiteTM' graph. The animals studied were clams, asteria, oyster (on eggs fertilization and larvae breeding), crustaceans, intertidal molluscs, lobsters, gastropoda and echinoiderms. Self citations dominate the citation statistics, percentile rankings going from 100% to 33%.

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The Citation Matrix.-
A stage in the visualization of "The Biological Bulletin" corpus is considering the citation matrix that 'HistComp' offers (see Table 3).

Articles from *Biological Bulletin*, 1945-2003 (Wed Aug 27 09:51:48 2003)
Nodes: 8884
Sorted by **year, journal, volume, page**.

cited nodes	Cited nodes	Nodes	GCS	LCS	citing nodes
	0	1 1945 VONBONDE C	3	1	17
1397	1	4301 1972 ZEUTHEN E	5	0	
3309	1	4302 1973 ATWOOD DG	20	6	4547 4845 5007 5810 7143 7534
1870	1	4303 1973 BRITZ SJ	7	0	
3429	1	4304 1973 BUCK J	21	3	4581 4842 5169
3452 3483 3874	3	4305 1973 ELDER HY	33	1	4418
4307	1	4306 1973 FRANCIS L	111	22	4307 4538 4717 4840 4903 5002 5214 5377 5380 5610 5746 5782 6196 6208 6213 6764 6766 6782 6956 7292 7412 8731
4306	1	4307 1973 FRANCIS L	140	31	4306 4717 4840 4842 4903 5002 5214 5377 5380 5610 5746 5782 5948 6003 6142 6184 6196 6213 6405 6764 6766 6782 6941 6956 6987 7065 7188 7217 7292 8069 8731
	0	4308 1973 FRANZ DR	14	3	6532 7608 8444
	0	4309 1973 FRIESEN LJ	19	0	

Table 3.- Citation matrix for the journal 'The Biological Bulletin' (partial view).
http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/index-cm.html

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Like a very torn and deformable fishing net (Price DJD, 1986. p. 268) is the structure of alternating cited and citing nodes. The pattern of linkage represents an item, its number of cited nodes, and the numerical codes identifying them, its global citation score (GCS) and its local citation frequency (LCS). The last data is set of citing nodes. Co citations and bibliographic couplings are at reach from the citation matrix. Any couple of cited nodes are a co citation, and all the pairs of citing nodes are bibliographically coupled. The matrix permits clustering using citing nodes (bibliographic coupling groups documents) and clustering using cited nodes (co citation links documents) (Morris SA et al., 2003).

The matrix leads to the identification of co citations easily viewed with the graph. For example, nodes 4306 and 4307 are co cited by nodes 4717, 4903 and 5380. Their interrelation is special for the 'sea anemone' cluster.

This relational structure can be called a "subject space" (Price DJD, 1986). It is said that this structure provides a natural and automatic "indexing". So built into the network linkage of the entire collection of "The Biological Bulletin" is a structural scheme. And we can traverse this map by using the citation matrix.

The idea behind understanding the informative effects of this citation matrix is the concept of additivity of the levels of reference. It means that inside the journal "The Biological Bulletin" an author that must only refer in his publications to his reading domain (the universe of articles that an author has read to write a text) is said to be in the zero reference level. He will be part of his one reference level if he is able to include in his references' lists the publications that were grouped in the zero level, plus the material that was referred inside the bibliographies of the zero level, and so on. We use the concept of additivity by assimilating it to linearity (a magnitude depends on others which are the result of a sum (Shapley Ll S, 1953). Therefore, the activity in local networks (the whole source papers published by 'The Biological Bulletin') of the authors finds a model that follows the pattern of the analysis of references (Kessler MM, 1966).

The article at node Nº 4555 (authored by Webster SK in 1975, see "Nodes" in http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/index-10.html) includes in its list of references 4 articles (Nº 1246, 3281, 3342, 4167) from the local collection (as identified by the column "Cited nodes", that expresses the local cited references or papers published by the 'Biological Bulletin' and employed as reference by Webster). SK Webster has read these articles; they are part of his reading domain, of his zero reference level. But, particularly, the article Nº 4167 is also part of his one reference level, because it can be admitted that Dr Webster has read the work of Dr K Johansen (art. Nº 3342) after finding it between those selected by Dr RJ Ulbricht (art. Nº 4167). And again the article Nº 3342 provides the two reference level as Dr Webster could have read the paper of Dr AC Giese (art. Nº 3281) once having located it in the list of reference of Dr K Johansen (art. Nº 3342).

Procedures for improvement and correction of the output of literature searches. The 'Outer references' and the 'Missing links'.

If the percentual selection threshold has been well chosen (here LCS > 12) then the user will obtain core papers of prime interest. But 'histcomp' produces a list of highly cited works outside this initial bibliography, the outer references. (see Table 4)

ISI Web of Science location: [   ]

Cited references outside of this network.
Total: 80764 (top 300 shown).
Sorted by **LCS**.

#	LCS	Reference
1	103	LOWRY OH, 1951, J BIOL CHEM, V193, P265 WoS
2	64	SOKAL RR, 1981, BIOMETRY, WoS
3	53	LAEMMLI UK, 1970, NATURE, V227, P680 WoS
4	51	BRADFORD MM, 1976, ANAL BIOCHEM, V72, P248 WoS
5	51	THORSON G, 1946, MEDD KOMM DAN FISK P, V4, P1 WoS
136	11	KLEINHOLZ LH, 1936, BIOL BULL, V70, P159 WoS
144	11	LILLIE FR, 1915, BIOL BULL, V28, P22 WoS
216	11	SCHARRER B, 1944, BIOL BULL, V87, P242 WoS
267	12	TYLER A, 1941, BIOL BULL, V81, P190 WoS
291	11	WILSON EB, 1903, BIOL BULL, V4, P197 WoS

Table 4.- 'Outer References' – Top five nodes exterior to the original bibliography and five 'The Biological Bulletin' reference outside the 'histcomp'.
http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/out-refs.html

This list is identified by the software 'histcomp' sorting the references used by the original core collection by citation score. These could be not only articles, but books and patents. For those included in WOS, a hotlink is provided which leads to the WOS search engine. The librarian can decide (Garfield E, Pudovkin AI & Istomin VI, 2003) whether to add these candidate references to the bibliography. For "*Biol. Bull.*" 5 articles do not turn up in the original WOS search (out of the 80764 (top 300 shown) cited references outside of this network listed by 'histcomp' as outer references). They are all previous to 1945, so they were not considered as source items at the moment of retrieval.

The WOK workaday makes conceivable the commission of mistakes in the articles introduction. Errors can be corrected and the routine for correction in 'histcomp' is called 'Missing Links' (see Table 5). It reports on the potential bibliographic description

missed data, by checking every doubtful reference against the main file. 116 were potentially missed citations in the 'Biological Bulletin' histcomp. Nodes have citations that may potentially refer to other nodes because of inconsistencies on pagination, inconsistencies of hyphenation, introduction of non-standard expressions in the bibliographic quote, etc.. These were the most frequent problems identified and it illustrates the usability of this device in the case of the 'Biological Bulletin'.

Potentially missed citations...
116 nodes have citations that may potentially refer to other nodes.
1 | [20] 1945 BIOLOGICAL BULLETIN 88(3):254-268
SPIEGELMAN S; STEINBACH HB
SUBSTRATE-ENZYME ORIENTATION DURING EMBRYONIC DEVELOPMENT

```
SPIEGELMAN S, 1945, UNPUB BIOL B, V89, may refer to 28
SPIEGELMAN-S-1945-V89-P122
```
2 | [173] 1947 BIOLOGICAL BULLETIN 92(2):115-150
LYNCH WF
THE BEHAVIOR AND METAMORPHOSIS OF THE LARVA OF BUGULA-NERITINA (LINNAEUS) - EXPERIMENTAL MODIFICATION OF THE LENGTH OF THE FREE-SWIMMING PERIOD AND THE RESPONSES OF THE LARVAE TO LIGHT AND GRAVITY

```
MILLER MA, 1946, BIOL B, V90, P121 may refer to 69 MILLER-
MA-1946-V90-P122
```

Table 5.- 'Missing Links' : Potentially missing citations, and 'variations'.
http://garfield.library.upenn.edu/histcomp/bio-bulletin_all-src/miss-links.html

Conclusion
From the bibliographical instruction (McInnis R, 1982) point of view those unfamiliar with a topic have a first and foremost information space with the histcomp for "The Biological Bulletin", published at Woods Hole. By identifying the main authors and considering the indicative labels provided by the graph.

As a frame of reference 'histcomp' is also useful for retracing the history of any research question, and it permits to the collection development librarian to orient the purchases by considering the main journals by looking at the importance of the articles.

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THE ROLE OF LIBRARIANS IN BRIDGING THE DIGITAL DIVIDE IN DEVELOPING COUNTRIES: A CASE FOR MALAWI

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ABSTRACT: There are a number of definitions of the digital divide, but Elena Murelli (2002) in her book 'Breaking the Digital Divide: Implications for Developing Countries' defined it as the gap between those people who have access to the new information and communication technologies and those who do not. The digital divide is usually measured in terms of the number of telephones, computers, and Internet users. Between groups of people within countries, it is usually measured in terms of race, gender, age, disability, location, and income. It seems the gap is more prominent between developed and developing countries and within the people in developing countries. This gap has to be bridged lest it gets out of hand. It is therefore the duty of all stakeholders including librarians to work in partnership to ensure that the gap is narrowed. Now the question is what are librarians, especially those in developing countries, doing in bridging this gap? In an effort to bridge the digital gap, librarians in Malawi are involved in a number of activities such as: training in online information searching and retrieval skills, lobbying with the government to bring into the country duty-free ICT equipment for educational purposes, facilitating in the increase of Internet bandwidth and lobbying with government to improve ICT infrastructure in the rural areas. This paper outlines what librarians in conjunction with other stakeholders are doing and ought to do to narrow the gap. The paper has put emphasis on the role of librarians in developing countries especially in Malawi in narrowing this digital divide. There are a number of challenges that these librarians in Malawi meet in their efforts. Some of the challenges are inadequate resources, that is, human, financial and material resources, illiteracy, unavailability of local online content and lack of government policy on information services. However, there is always a way forward which the paper suggests.

Introduction

Malawi is one of the developing countries affected by the problem of the digital divide. But a lot is being done especially by librarians to bridge the digital gap. Below is what Malawi in general and librarians in particular are doing in trying to bridge the digital divide. Mentioned in the paper are some of the challenges the country and librarians face in mitigating the problem.

Definition of Digital Divide

The term is used to describe the discrepancy between people who have access to and the resources to use new information and communication tools, such as the Internet, and people who do not have the resources and access to the technology. The term also describes the discrepancy between those who have the skills, knowledge and abilities to use the technologies and those who do not. The digital divide can exist between those living in rural areas and those living in urban areas, between the educated and uneducated, between economic classes, and on a global scale between more and less industrially developed nations.

Bridging The Digital Divide in Malawi

Malawi as a nation is trying to bridge the digital divide as is evident in the various developments in ICT especially in the last ten years.

Developments in ICT

Improved telecommunications services. In the past ten years or so, telecommunication facilities have improved. Over the years Malawi has seen the introduction of cell phones, an increase in the number of telephone lines, radio stations, phone bureaus, Internet cafés and Internet service providers. Below are some figures for 2003 and 2006.

Table 1. Telecommunications indicators

	2003	2006
Cell phones	136,114	429,000
Telephone lines	37,371	102,784
ISP	6	10
Internet users	9,651	46,100
Mobile operators	2	2
Radio Stations	7	13

Source: NSO. Statistical Yearbook 2004.

Duty waiver on pre-assembled computers, printers, etc. The government removed duty on all pre-assembled computers and accessories. However, spare parts for computers are charged duty.

SchoolNet Malawi Project
SchoolNet Malawi currently has 50 participating schools. SchoolNet Malawi aims at providing Malawian children, at primary and secondary levels, with an opportunity to learn about new technologies in the field of ICT in order to compete in the global knowledge based economy. In line with the Ministry of Education's policy of equitable access to education opportunities, SchoolNet Malawi therefore, provides and facilitates ICT development in schools.

In providing and facilitating access to ICTs for schools, SchoolNet Malawi has the following objectives:
1. To market, lobby ICT development initiatives to schools, Community Based Organizations, private sector and the donor community.
2. To establish a well functioning, transparent organization that is capable of implementing ICT development in Malawi.
3. Building sustainable human resources capacities that are able to effectively implement the set programmes.
4. To provide schools with connectivity learning facilities, locally and internationally.
5. Collaboratively with the Ministry of Education, supplement the current schools education system with ICT content and curriculum.
6. Research and create ways of strengthening the development of ICTs in Malawi.
7. To develop a well functioning, sustainable technical distribution and support centre that is capable of providing services to the whole nation

Since its inception in 1999 SchoolNet Malawi has distributed over 832 computers to 50 participating schools.

Development of National Policies
The country has come up with a number of policies among which are the ICT for Development (ICT4D) Policy and The National Policy on Library, Documentation, and Information Services. The development of such policies give broad guidelines from which action programmes and services can be developed to facilitate meaningful involvement of the national information infrastructure in the country's vision and strategic planning.

Malawi Librarians in Bridging the Digital gap

Librarians in Malawi are involved in a number of activities that aim at bridging the digital gap in the country and beyond.

Increased Bandwidth and Optimize its Usage
Librarians are in the forefront in increasing and optimizing usage of bandwidth. One of the major activities is the establishment of the Malawi Library Information Consortium (MALICO) (http://www.malico.mw/) whose main objective is to improve access to electronic information. MALICO has within a few years of its existence:

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- Brought into the country four V-SATs with funding from the Open Society Initiative for Southern Africa (OSISA) among other donors. These V-SATs were installed in February 2005. Three of the four V-SATs are at University of Malawi colleges namely: Bunda College of Agriculture, Chancellor College and College of Medicine and the fourth one is at Mzuzu University. The coming of the V-SATs has increased the bandwidth ranging from 128kbps - 512kbps uplink and 256kbps – 1mbps downlink. This translates to an increased access to electronic information by users. Those libraries and information centres without a V-SAT connection, request the V-SATs sites to assist in downloading large amounts of information for them. However, it is the intention of MALICO to have all its member institutions connected to the V-SATs through either a radio link or any other technology. The installation of the four VSATs has eased and increased accessibility to electronic information. Below are some statistics for January – June 2006 from International Availability of Scientific Publications' (INASP) Programme for the Enhancement of Research Information (PERI). MALICO members contribute to the subscription of e-resources offered to the country by PERI and eiFL (Electronic Information for Libraries).

Table 2. Statistics on use of PERI Resources in Malawi January-June 2006

	January	**February**	**March**	**April**	**May**	**June**	**TOTAL**
Users	86	86	106	131	157	157	2452
Searches	649	1049	654	476	720	1093	4641
Table of Contents	0	3	26	2	4	4	39
Abstracts	150	325	208	137	217	323	3632
Articles	248	434	368	281	377	464	2172

Source: http://www.inasp.info/scgi-bin/peri/admin/

- Subscribes to electronic journals through PERI and eiFL programmes. Some of the electronic resources, which MALICO subscribes to for its members, are Ebsco Host, Emerald, Oxford University Press E-Journals, African Journal Online and Springer. MALICO subscribed to e-journals worth US$20,000 for 2006.

Apart from the e-resources which MALICO subscribes for its members, libraries in Malawi access to other e-resources which are offered for free through organizations such as Food and Agriculture Organization (FAO), World Health Organization (WHO) and The Technical Centre for Agriculture and Rural Development (CTA). Some of the resources are AGORA (Access to Global Online Resources in Agriculture), HINARI (Health InterNetwork Access to Research Initiative).

Digitizing Malawi Publications
Individual libraries, although still few, are moving closer to digitization of Malawi publications so that they are accessible online. For instance the College of Medicine of the University of Malawi (UNIMA) using Greenstone software has digitized over 300 publications that are accessible online. University of Malawi, Central Library Services bought digitization equipment almost two years ago to use for digitizing Malawiana, but the equipment is yet to be utilized because of lack of appropriate software and expertise. All University of Malawi Libraries including Bunda College Library are looking forward to participate in the digitization once everything is in place. Another initiative again by the University of Malawi Libraries is the development of a proposal for funding to digitize Malawiana and create institutional repositories as part of plans to commence a master's degree programme in library and information science. Digitization is one of the research areas in the programme. The proposal was sent to Norway for possible funding by NUFU (Norwegian Council for Higher Education's Programme for Development, Research and Education and other partners). Even if this proposal does not get external funding, UNIMA libraries are determined to commence the degree programme by 2007 using its local resources.

Capacity Building
Librarians are actively involved in capacity building for ICT in an effort to bridge the digital divide.

- *Internet for Influence Programme.* In this programme, which was initiated by the British Council (Malawi office), librarians train different groups in how to use computers in general and how to access electronic information using the Internet in particular. So far some women members of parliament, young women leaders, journalists and lawyers have been trained.

- *Use of Electronic Information Resources.* On a regular basis, librarians train their users on how to search and retrieve quality and relevant electronic information. Training is done by individual institutions or with the support of organizations such as MALICO, Malawi Library Association (MALA), International Network for the Availability of Scientific Publications (INASP), IAMSLIC, Food and Agriculture Organization (FAO) and Technical Centre for Agriculture and Rural Development (CTA)

- *Introduction to Library Automation Course.* The Malawi Library Association (MALA) runs a one year certificate course in library studies for its members and those interested. Among the topics covered is an introduction to library automation. The association also organizes short courses on ICT. The course introduces the various uses of ICT in libraries and information services.

- *ICT training by the Information Resource Centre (IRC) of the American Embassy.* Librarians at IRC have conducted ICT training since 2001. They target groups working in areas such as education, health, judiciary, HIV and AIDS, small and

medium enterprises, and those belonging to various religious groups. So far the section has trained over 200 people. IRC through the Public Affairs Section of the Embassy has also established what they call '*American Corners'* in the three major libraries in the country's three regions. American Corners are like Internet cafes with at least five computers on a network. They are open to the general public at a small fee for Internet access.

- ***Library and Information Science and ICT degree programmes at Mzuzu University.*** In 2005 the Faculty of Information Science and Communication at Mzuzu University started two bachelor's degree programmes aimed at reducing the shortage of trained personnel in the areas of library and information sciences and ICT in Malawi. The programmes had an initial intake of over 15 students each. Once the programmes start graduating students over the next two years, the country will experience an increase in the number of trained personnel who will make a substantial difference in the 'fight' to bridge the digital gap.

National Library Services of Malawi – ICT Activities
National Library Services of Malawi (NLS) is one of the largest libraries in the country offering a number of programmes and services throughout the country using its own resources and those from its partners such as Book Aid International, CODE Canada, NORAD, World Bank and Malawi National AIDS Commission. Among its activities are offering ICT services to its users. Below are some of the notable initiatives:

- ***Mother and Child Project.*** The project, which aims at encouraging mothers to read and tell stories to their children, has introduced computer games and lessons so that the children are encouraged to learn how to use computers at a very early stage. The children involved are aged between three to twelve years. The project which started at the head library in Lilongwe is one year old, and is to spread to the other two regions of the country by 2007.

- ***Baobab Project.*** National Library Services is embarking on a project to provide some low cost ICT services in its ten branch libraries scattered throughout the country through what is called 'Baobab project'. In this project, NLS would acquire at least two low cost computers (costing about US$160 per computer) running on low power (110amps) for each branch library. These computers are to run on solar panels or wind turbines with a high life battery. It is envisaged that once NLS install these computers would be used for OPAC (using Koha http://www.koha.org - open source software) and access to the Internet. Most of the NLS branch libraries are in rural areas with no electricity. As such this project will enable branch libraries to offer certain ICT services to the users, especially in rural areas.

Malawi Research and Education Network (MAREN) Activities
Librarians are participating in MAREN activities to ensure fast and reliable Internet connectivity. MAREN was founded in October 2005 to offer a single focus for pursuing excellent Internet connectivity for the Tertiary Education and Research Sectors in

Malawi. It builds on the head start offered by Malawi Library and Information Consortium (MALICO) VSATs network but aims to go further by providing fast fiber connectivity linked to neighboring countries, to the rest of Africa and to the EU academic network. Until it gains its own legal identity, MAREN is working within the legal framework of MALICO. Currently members are the two public universities – University of Malawi and Mzuzu University and the National College of Information Technology. MAREN works in a regional grouping known as UbuntuNet Alliance for Research and Education Networking. The vision of delivering very high speed - gigabits (Gb/s) connectivity instead of the current kilobits (kb/s) between African Universities and Research Institutions is driving the Alliance forward at a rapid pace. So far MAREN has been involved in the following activities which are now at various stages:

- o Developing a campus connected with fiber cables for the University of Malawi sites: College of Medicine and related medical research complexes, Blantyre Campus of Kamuzu College of Nursing and the Malawi Polytechnic
- o Working with ESCOM, (the Electricity Supply Corporation of Malawi), to utilize the two fiber strands given to MAREN for academic connectivity for 3 years
- o Working with MACRA, (Malawi Communications Regulatory Authority), for harmonious regulatory conditions for academic connectivity
- o Collaborating on the activities aimed at establishing the Malawi Internet Exchange.

Challenges

Despite the positive developments mentioned above, the battle to bridge the digital divide is facing a number of challenges:

- **Funding.** There is a lot of dependence on donors/partners to fund activities that aim at bridging the digital gap. Libraries in Malawi are getting funding support from partners such as FAO, Norwegian Agency for Development (NORAD), Book Aid International, World Bank, Department for International Development (DFID), Japanese International Cooperation Agency (JICA) and Swedish International Development Agency (SIDA) for most of their ICT activities and programmes. Most of the institutions have no budgets for ICT. This is not a healthy situation considering that partners may one day decide to withdraw their support.

- **Inadequate ICT Expertise.** The country does not have enough people with ICT skills, especially librarians. This is an area in which Malawi as a country has not done well. There are about twenty trained librarians and 20% of them have very little expertise in ICT. However, the introduction of two degree programmes on Library and Information Science and ICT at the Faculty of Information Sciences and Communications of Mzuzu University and the impending commencement of a master's degree programme by the University of Malawi, gives hope for good things

to come. Once these programmes start graduating candidates over the next three years, the situation will improve.

- **Illiteracy.** Malawi has about 20% of its population aged 5 years and above that have never attended school[1]. Very few of the Malawians who are literate have even basic computer skills. Much as librarians and others are involved in computer skills training, there is a lot to be done. In addition, there is growing concern in Africa in general and Malawi in particular on the absence of African languages on the Internet. Gumisai Mutume[2] writes "The dominance of European languages has limited the spread of Internet use by excluding those not fully literate in those languages'. However, the activities of SchoolNet Malawi and National Library Services – Mother and Child project are some of the mitigating efforts to increase computer literacy skills.

- **Malawi Content Online.** There is not much Malawi content online. Librarians are supposed to seriously embark on digitization of Malawiana publications and make them available online, once the digitization efforts outlined above start bearing more fruits.

Conclusion

Librarians in Malawi, both within their own capabilities and by working with other stakeholders, are doing a lot to bridge the digital gap. However, there is a long to go.

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INFORMATION RESOURCES FOR SOME SELECTED MARINE AND AQUATIC INSTITUTIONS IN AFRICA

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Abstract
The fishing industry in Africa is based on resources from the marine and to a lesser extent, inland (freshwater) and aquaculture sectors.

Libraries and the information that they provide constitute the building blocks of national development. The collection and dissemination of information is one of the primary tasks of libraries and information centers.

Maintaining an information resource in support of research and management activities in Africa has been costly as such many libraries traditionally cooperate within information networks in order to provide the most cost-effective services to their clients.

This paper focuses on the important role of libraries in promoting and managing fisheries information resources. It provides an overview of the status of some selected libraries or information centers in Ghana, Kenya, South Africa and Tunisia and the products and services they provide. It also highlights the management systems currently in use in carrying out the routine activities in these selected institutions.

GHANA

Marine Fisheries Research Division
The Marine Fisheries Research Division (MFRD) was established in 1962. It is located in Tema in the Greater Accra Region. It is under the auspices of the Ministry of Fisheries.

The Ministry of Fisheries exists to promote sustainable and thriving fishing industry through research, technology development, extension and other support services. It also has the mandate to promote local, sub-regional and international co-operation in fisheries management and development. Further, it co-ordinates and collaborates with other departments and agencies for the enforcement of fisheries laws, regulations and bye-laws.

Artisanal Marine Fisheries

In Ghana, artisanal marine fisheries are the backbone of the fishing industry. The small pelagic fish stocks, which form a large component of the artisanal and marine fisheries in Ghana, cover a wide range of species and are the most abundant marine resources in Ghanaian waters. Four species that are of high economic value are the round sardinella (Sardinella aurita) flat sardinella (S.maderensin), anchovy (Engraulis encrasicolus), and chub mackerel (Scomber, japonicus).

These species usually account for over 80% of total landings of the small pelagic resources annually. The potential annual yield is about 200,000 Mt (Entsua-Mensah and Virdin, 2005).

The Marine Fisheries Sector in Ghana contributes about 30% of the nation's gross domestic product (GDP) and 50% of the Agriculture GDP.

Fish is the preferred and cheapest source of animal protein and about 75% of total production of fish is consumed locally. Fish is now the country's most important non-traditional export. The country earned over US$95 million from export of fish and fishery products in 2002 (MOFA 2004).

The Marine Fisheries Research Library

The Library was established in 1968 to perform the role of providing access to domestic and foreign literature in the fishery and related sectors of the economy.

Stock

The library currently houses approximately 7,676 books. The collection covers a wide range of subjects on hydrography, population dynamics, oceanography, marine biology, fishery statistics, fishing gear technology, and stock assessment. It has a collection of grey literature, serials and maps. The collection also includes publications of international organizations concerned with fisheries and the marine environment such as FAO, UNEP, UNESCO-IOC.

Library Software/Databases

The MFRD library uses InMAGIC Software, a fully integrated library automation system which includes circulation, loans, acquisitions, cataloguing and retrieval of information. The library receives Aquatic Biology, Aquaculture and Fisheries Resources (ABAFR) on CD-Rom.

The use of ICT has made information resources accessible on-line in various forms. MFRD has a number of computers with Internet connectivity and as such has access to some electronic resources and services such as African Journals Online (AJOL) and Access to Global Online Research in Agriculture (AGORA).

Library Information Network

Libraries in Africa link with other organizations and networks in order to provide the must cost-effective services to other users, thus ensuring information sharing through

Inter-library Lending and Document Delivery (ILL/DD). MFRD is a member of AFRIAMSLIC and ODINAFRICA.

SOUTH AFRICA

The South African Institute of Aquatic Biodiversity (SAIAB) in Grahamstown is one of the leading aquatic research institutes in Southern Africa.

The Margaret Smith Library

It was established in the late 1960's as a branch library of the Rhodes University as such has access to a number of databases and e-journals. SAIAB's research and partnership activities are serviced by the Margaret Smith Library with its extensive holdings on fisheries, aquaculture and biodiversity.

Stock

The library holds one of the largest multi-media collections of fish publications. It currently has 4,881 books and 1,745 journals. Current journal subscriptions for 2006 stands at 48 titles. It receives 193 journals via Exchange Agreements. It has reprint collections of over 4,000 items dating back to 1842; 40 CD Roms and 28 videos.

Library Software/Databases

It uses the Millennium Software with (Innovative Interfaces)
The Millennium system provides online public access via the Rhodes University Library Electronic Resources Webpage. These are:

- Academic Search Premier (via EBSCO host) which provides full text access to more than 4,500 publications.
- Science Direct which provides full text access to more than 1,800 titles of Elsevier Science journal collections.
- Springer Link which provides access to more than 4,500 full text journals.
- Fish and Fisheries Worldwide Online via Biblioline and CD ROM.
- Access to full text online journals via International Network for the Availability of Scientific Publications (INASP) programme.
- Access to Global Online Research in Agriculture (AGORA)
- Access to African Journals Online (AJOL)

Library Information Networks

Information networks and other regional initiatives are undertaken in the form of national inter-library loans, publications exchange agreements, networking with fisheries institutions in Africa.

The International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) project, the Z39.50 Distributed Library received 481 serial titles submitted by SAIAB as part of efforts aimed at facilitating international resource sharing among marine and aquatic science libraries.

In 2002, SAIAB worked with FAO in coordinating a pilot project with a core group of libraries in selected fisheries institutions in Africa. The aim of the project was to improve access to information resource sharing capacity between Africa fisheries libraries.

As a follow up, SAIAB hosted a Resource Sharing Workshop in Grahamstown in November 2003 to discuss with participants, ways of collaboration within the network.

KENYA

The Kenya Marine and Fisheries Research Institute (KMFRI) was established in 1979 from the defunct East African Marine and Freshwater Research Organization (EAMFRO). Its main objective is to undertake research into marine and fresh water fisheries, aquatic sciences, biological, chemical, and physical oceanography, limnology, pollution, aquaculture, natural products and marine geology.

KMFRI Library

The Library which was established in 1979 inherited its initial collections from the Eastern African Marine and Freshwater Research Orgainization (EAMFRO). The KMFRI library is also made up of the Mombasa and Kisumu libraries serving marine and freshwater sectors in the country.

Stock

The library has about 5,000 titles including publications deposited by government, international organizations and other institutions dealing in ocean and marine research world wide. A number of 80 journal titles, pamphlets, periodicals and reprints, videos and ASFA CD Roms are currently available at KMFRI.

Library Software/Databases

InMAGIC, ASFIS methodologies K-LIB, KENDOC, are some of the databases at KMFRI library. The library has access to e-journals through INASP and AGORA. It also installed the Prospero Document Delivery Software thus making document delivery much faster.

Literature services are rendered by KMFRI through:
- AFRILIB- Africa's library Holdings which is a collective catalogue of library holdings in cooperating institutions.
- AFRIPUB – a catalogue of scientific journals, articles and monographs published by African ocean scientist.
- AFRICURRENT – Current Awareness Services, which is an awareness tool based on user's profiles of specific subject interests.
- AFRIDIR – a directory of marine and freshwater professionals in Africa.

Library Information Networks

Regional Co-operation in Scientific Information Exchange in the Western Indian Ocean (RECOSIX-WIO) which was an information project working towards a lasting network

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of marine and aquatic institutions in the Western Indian Ocean region, was launched in 1989 with funding from UNESCO-IOC with KMFRI library as host. The main objective of RECOSIX-WIO included providing the necessary bibliographic and scientific literature and promoting communication among marine scientists.

Ocean Data and Information Network for Africa (ODINAFRICA) was launched as a follow-up to the RECOSIX WIO. While RECOSIX- WIO was mainly focused on the Western Indian Ocean, ODINAFRICA covered most of Africa's coastal states. ODINAFRICA aims at enabling all members states:
- to get access to data available in the data centers
- to develop skills for manipulation of data
- to develop infrastructure for archival analysis and disseminate data and information products.

The major impact of these projects is the development and dissemination of marine and coastal information products responding to the needs of a wide variety of user groups using national and regional networks.
KMFRI submitted a total of 32 serial titles to the Z39. 50 Distributed Library to enhance resource sharing activities of IAMSLIC. KMFRI also become an Aquatic Sciences and Fisheries Abstract (ASFA) Input centre ensuring that grey literature is widely disseminated in the Western Indian Ocean region.

TUNISIA
Institut National des Sciences et Technologie de la Mer (INSTM)
The Institut des Sciences et Technologies de la Mer (INSTM) was established in 1924. It is affiliated to the Secretariat d' Etat à a Recherche Scientifique et à la Technologie (SERIT).

The Mission of INSTM consists of:
- conducting contractual research programmes are related directly or indirectly to the sea and its resources: fishing, agriculture, marine environment, sea technologies, oceanography, etc.
- participating in different national, regional and international networks related to the sea.
- contributing to the resolution of problems related to the development of urban and economic activities on the coast as well as in territorial waters.
- transferring its know-how and the results of its research to decision makers, professionals of the sea and scientists.
- helping with decision making processes in issues relating to the sustainable management of the sea and its resources.
- contributing to the diffusion of knowledge and education about marine issues and to raising the public's consciousness for the protection and preservation of the sea and its biodiversity.

INSTM Library
The library is rich into thousands of volumes with several works dating from the 16th century. The library produces information awareness services; announcing lists of new acquisitions, current periodicals, theses and dissertations.

Stock
The INSTM Library has 5,280 books on aquaculture and marine resources. It has 1,156 journal titles and currently subscribes to 30 journals. The library has acquired a total number of 148 videos and CD- Roms, dissertations, theses, reports and sea charts. It has on-line access to journals.

Library Software/Databases
The database used are specialized in the fields of aquaculture, living resources, marine environment and fishing techniques.
InMAGIC, CDS/ISIS and ASFIS methodologies are some of the library software and database used in managing records at INSTIM.
The library puts at the disposal of its readers a certain number of on-line bibliographical tools such as ASFA and Oceanic Abstracts. It also has a computerized catalogue based on the Computerized Documentary Service, Integrated Sets of Information System (CDS/ISIS)

Library Information Network
It is an ASFA input centre, capturing and disseminating literature on aquaculture and marine resources. It is a member of ODINAFRICA, IAMSLIC and EURASLIC.

Conscious of the importance of and the need for undertaking research in coordination with foreign partners, INSTM maintains scientific collaboration with several partners such as FAO's **COPEMED** project for the development of Exploitation of Fisheries in the Western basin of the Mediterranean and the **Medsudmed** project for the follow-up and evaluation of the environmental resources and systems in the straits of Sicily.

CONCLUSION

The importance of aquatic and marine science cannot be over emphasized. It is the knowledge behind the production function of aquatic ecosystem for water, food and the environment. Every planning process that leads to an enhanced development of a nation must be based on reliable and adequate information.

Therefore information resources in both printed and electronic format is essential in libraries and information centers. Facilities such as storage devices, organization, resource sharing, retrieval and management systems, including human resources development are essential in providing access to scientific and technical literature in support of marine and aquatic institutions.

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CURRENT ACTIVITIES OF THE EUROPEAN COUNTRIES IN ECONOMIC TRANSITION GROUP

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ABSTRACT: Information management in most ECET-countries has undergone substantial change and in many cases led to a decline in services and existing library networks. Support from international organizations was needed to reestablish information management sector to current international standards. The already existing ODIN-networks in other areas are good examples of the kind of support sought. A European ODIN will include ECET Union Catalogue of Serials project and the Black Sea Library Cooperation Project.

Cooperation between the aquatic libraries in Central and Eastern Europe is given strong support from IODE IOC, IAMSLIC and EURASLIC. To adapt a marine information management in the region to international standards and to support the networking of libraries, a series of initiatives should be put into practice, in particular, those related to continuous professional development of the personnel and up-to-date re-equipping of the libraries. Integration of the libraries of so vast the region into a unified network and involving them in joint projects is an essential though difficult task.

The survey initiated by the EURASLIC ECET (European Countries in Economical Transition) Group and conducted in 15 aquatic libraries of Russia and Ukraine in autumn 2005 has shown that:

1. most of the staff need receiving intense training in marine information management;
2. the libraries are usually technically under-equipped and therefore cannot satisfy today's needs to the full;
3. the fact that the personnel cannot use foreign languages obstructs the international cooperation.

Moreover, in Russia the national network of aquatic and marine libraries is more dead than alive. In the scientific world the stated factors inevitably reduce the status of library from the institution's division of top importance to a ballast.

In other regions librarians also face similar difficulties. A possible solution to the problem is creating a network of the aquatic libraries and information centers as a constituent of the Ocean Data and Information Network (ODIN) projects supported by IODE IOC. A good examples are the ODINAFRICA and ODINCARSA projects which are successfully implemented in 25 African and 18 South American countries.
In Europe the situation is of a special character. Unlike other regions where similar projects suggest both marine information and data management, in Europe the first stage of the ODIN project focuses on the marine information sector alone as the best prepared for successful implementation. A contributing factor is that the EURASLIC ECET group actively participates in the joint projects. Later, the marine data sector will also be developed as a component of the project. What is important is that we are not developing the regional aquatic library network from zero but rather reviving and adjusting the once efficient network to the modern reality.

In 2004, the 8th session of the IODE Group of Experts on Marine Information (GEMIM-VIII) of the UNESCO Intergovernmental Oceanographic Commission (IOC) was held. The participants of the meeting have adopted the proposal made by Jan Haspeslagh, EURASLIC president about uniting the aquatic libraries of Central and Eastern Europe into an actively operating network that would be a project incorporated into the ODIN serial project. The 18th session of IODE (Oostende, 26-30 April 2005) has approved the report submitted from the GEMIM that set the essential preconditions for drawing up the pilot project.
In October 2005 the session of the Coordinating Group (IODE Project Office, Oostende, Belgium) took a decision to elaborate a concept document that would specify the goals and tasks of the project and the steps towards their realization. The project was named The Ocean Data and Information Network for the European Countries in Economic Transition (ODINECET). Its first stage concentrates on marine information management and all aquatic libraries of Central and Eastern Europe are welcome to participation.

The kick-off meeting of the coordinating group was held on 25th March 2006 in Oostende, Belgium; the document about launching the ODINECET project was adopted and the main objectives were formulated as follows:

1. **To support the networking of aquatic libraries in ECET countries.** Secondly, a coordinating center should be organized in Russia. The latter is of special significance because of the huge expanse of the country where the number of aquatic libraries and marine information centers is so large. An on-line survey will be undertaken to clarify the needs and the actual state of marine libraries in the region. The documents should be drawn up ready to be used for recruiting more participants in the project.

2. **To support the development of national aquatic information centers and the related national/regional projects.** The activities related to the project ECET UNION Catalogue of Serials, in particular, updating the catalogue with meta-data having been collected through the Black Sea Regional Cooperation project (BLICOP) will be continued. The ECET UNION Catalogue of Serials project suggests that in the nearest future the electronic repositories will be created in the participating institutes.

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These repositories will comprise both published (proceedings, articles, dissertations) and unpublished (research reports, papers on methodology, etc.) works. Selecting materials for inclusion into the institute's e-repository is up to participants of the project. The ODINECET project implies that a training course on using the pertinent software be offered to the participants given the financial support of the IODE Project Office.

Technical needs are also taken into consideration. The nearest task is to specify what kind of equipment (computers, scanners, printers) the libraries would need to carry out the works on ODINECET projects and to identify possible sponsors in cooperation with the IODE Project Office.

3. **Providing training opportunities in marine information management, applying standard formats and methodologies as defined by IODE.** The financial support from the IODE Project Office allowed to have organized the first two-week training course on marine information management (MIM, basic level) that 15 librarians from Russia, Ukraine, Poland, Bulgaria, Latvia, Estonia and Croatia received before the ODINECET project has officially been launched. The participants have learnt about the possibilities offered by IOC, the activities of IOC Project Office for IODE and about OceanPortal, too. A special lecture told about benefits of international networking (IAMSLIC, EURASLIC and IOC). The lectures by Paul Nieuwenhuysen on Databases, computerized information retrieval + assignments and Online access information sources and retrieval stirred up considerable interest. The principal task that the course set to the participants was to specify Strategic Action Plan for their libraries. All the participants have learned much new through the training and gained a valuable experience.
The timetable for 2006-2008 suggests giving a series of basic and intermediate training courses in marine information management at the IODE Project Office: the regional basic training course in Ukraine timed for the 12th Conference of EURASLIC to be held in May 2007, the training and consultations to the trainers on adaptation the OceanTeacher programme to the regional background.

4. **Assist with development and dissemination of aquatic information responding to the needs of the regional scientific community.** The partnership will concentrate on updating the directory of experts in aquatic sciences (Oceanexpert) with regional information and on involving more aquatic libraries of the region in the EURASLIC and IAMSLIC ILL-networks.
Urgent tasks set to the Intersessional Working Group are, firstly, to conduct the survey on the current state and needs of regional libraries and, secondly, to identify the subjects for the forthcoming training courses based on the questionnaire results. Two regional marine information projects are also carried out under supervision of the working group.

The ECET UNION Catalogue of Serials and BLICOP projects are worthy of special consideration. These projects were initiated several years ago and are partially supported through grants from IAMSLIC and EURASLIC. First results have been reported at the

conferences held by these associations (1, 2). Recently the activities planned by the scenario of ODINECET projects were revived.

The ECET UNION Catalogue of Serials.
By now the Catalogue holds data about 154 regional periodicals and serials, predominantly in Russian, which are found in nine libraries participating in the project. Six of the libraries are in Russia, two in Ukraine and one in Estonia. The centralized data input is performed in the library of the All-Russian Federal Research Institute of Fishery and Oceanography in Access format. The resulting file was sent to VLIZ to import the batch of data into the IMIS database. Since May 2006 the ECET UNION Catalogue is accessible without limitations through *http://www.euraslic.org*. Copies can be requested directly from the serial record without exiting the database.

Originally, the Catalogue was thought to comprise data about all periodicals and serials available in the participating libraries. However, during the meeting organized within the framework of the 11th EURASLIC Conference, the EURASLIC Workshop adopted a decision to confine the first stage of the project to regional periodicals only, putting particular emphasis on the quality and fullness of the information. This opens the access to rare publications of the past, information about which is nearly absent in Internet. Presumably, the next step will make e-repositories of the institutes accessible through the Catalogue.

BLICOP
Black Sea Regional Cooperation Project (BLICOP) started in 2002 as a preliminary stage. The project core group currently includes the scientific libraries of the Institute of Oceanology (Varna, Bulgaria), the Georgian Marine Ecology and Fisheries Institute (Batumi, Georgia), the Research Institute of the Azov Sea Fishery Problems (Rostov-on-Don, Russia) and the Institute of Biology of the Southern Seas (Sevastopol, Ukraine). It is anticipated that aquatic research institutes in both Romania and Turkey will also be involved in the implementation of the Project.
Phase 1 in detail was: An assessment of the literature resources relating to the Black Sea held in all relevant institutions in the Region.
Questionnaire was compiled and emailed to each of the Institute libraries to assess the status of the collections and equipment in aquatic science institute libraries in the Region. Based on the answered Questionnaires The Directory of relevant institutes and their libraries was compiled and the availability of equipment, electronic catalogue and software was ascertained. The results of the survey indicate that almost all the libraries possess a computer or even few. However, some of the equipment is rather old.
One of the items of the Questionnaire was about card and online catalogues on the Black Sea. The tentative survey indicates that the number of the cards held in the libraries totals **35528** and the inputs into e-catalogues - **7917**. Some of the libraries do not have e-catalogues.

Now it approximates the second stage and is believed to happily develop further. In Ukraine all the preliminary work was done in two aquatic libraries in Sevastopol – one at

the Marine Hydrophysical Institute and the other at the Institute of Biology of the Southern Seas (IBSS).

Scientific library of the Marine Hydrophysical Institute has compiled the annotated English/Russian Electronic Index of the institute's scientific papers that have been published for 75 years. Most of these publications focus on diverse investigations conducted in the Black Sea. The Index is to be the basic tool in solving the tasks set by BLICOP. Scientific library of the Institute of Biology of the Southern Seas has accomplished compiling the electronic catalogue based on the institute's card file of publications on the Black Sea, the first records of which are dated 1871 - the year when Sevastopol Biological Station, later the IBSS, and the library were founded.

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SET UP AN INSTITUTIONAL REPOSITORY AND AN OAI HARVESTER FOR MARINE AND AQUATIC SCIENCES, AT IFREMER

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Abstract: In August 2005, Ifremer launched Archimer (http://www.ifremer.fr/docelec/), its institutional repository: a full-text database providing free access to publications, theses, conference proceedings, and internal reports. As part of the Open Access movement, this database promotes Ifremer's works on an international scale. A year later Archimer offers more than 1,400 documents of which more than 70% of those publications have been written or co-written by Ifremer since August 2005.

As a supporting step towards the Open Access movement, Ifremer, through the La Perouse Library, also developed Avano (http://www.ifremer.fr/avano/), an OAI harvester for the Marine and Aquatic Sciences. This harvester collects bibliographical data of electronic resources (documentation, images, datasets, videos, audio files) stored in a group of Open Archives and aggregates them in a centralized database. This harvester not only indexes resource references contained in the Marine Science archives of specialized research organizations, but also indexes a selection of resources linked to Marine Science placed in other open archives (ex: ArXiv, Pubmed Central) It is our wish, during this 32nd IAMSLIC conference to present this new project and show its value, especially in the framework of the Aquatic Commons project.

Key-words: Open Access, Institutional Repository, Open Archive, OAI Harvester, Post-publication, Archimer, Avano, Electronic documentation.

Introduction

Since the beginning of the 90's and in order to counteract abusive commercial politics established by some of the scientific publishers, scientific communities created pre-print servers to provide free and immediate access to their work (ex : ArXiv, for Physics and RePec, for Economics).

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In 2001, the OAI organization (Open Archive Initiative) formalized an interrogation protocol for those archives. The goal of the OAI-PMH (Open Archive Initiative Protocol for Metadata Harvesting) protocol is to allow the interoperability of Open Archives. So, if the Archives could not communicate with one another, an end-user would need to interrogate each archive one after the other in order to find a document. Since archive projects are multiplying fast, it is becoming impossible to efficiently conduct a search by using this method.

To simplify the access to documentation available in the archives, the OAI-PMH protocol defines two roles:

- **Data providers** create archives, therefore providing access to resources they enter in them. OAI-PMH compatible archives allow to collect (or harvest) bibliographical data of their resources through a series of standardized commands defined in the OAI-PMH protocol.

- **Service providers** can collect bibliographical data from several archives and gather them in order to create their own database. Therefore, this enables their end-users to interrogate databases corresponding to entire or partial archives. As an example, the Oaister database indexes all of more than 700 archives. Lastly, database records offer hypertext links to full-text documents which remain hosted on the archive servers.

Through Archimer, Ifremer becomes a data provider as a part of the Open Access movement. Through the development of a harvester specializing in Marine Science, Ifremer also becomes a service provider.

Archimer, the Ifremer Institutional Repository archive

Ifremer's interest

Supporting the Open Access movement

Opening an institutional repository brings concrete support to the « Open Access » movement, which progress Ifremer could benefit from in the long run. Rightly so, for several years Ifremer has suffered from subscription raises, just like all other major scientific libraries, established by major scientific publishers and unrelated to inflation. Those raises are forcing it to allot an ever increasing part of its budget to journal subscription contracts to the detriment of other sources of information.

If most international scientific community publications were to become access free on the Web through an Open Archive network, they could become a true alternative to subscriptions offered by scientific publishers. Even without imagining that one day there could be no need for subscriptions, we could be eventually better armed to negotiate our contracts with those scientific publishers on the account of this new data.

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Promoting scientific production

Even if free access to all international scientific documentation is a long term goal, setting up an institutional repository at Ifremer should have an immediate effect on its works visibility. Rightly so, several studies show that free access articles are more cited than articles only accessible through Web scientific publishers. Ifremer's free distribution of its publications via Archimer could highly improve their scientific impact.

Creating a new database dedicated to Ocean Science

When the amount of documents available in Archimer will reach a critical level, we hope that the Ifremer staff will see this database not only as a way of promoting its works outside the Institute, but also as a **work base useful for its research. This database should eventually aggregate many documents currently disseminated throughout several servers**. It should also bring access to documents, such as theses which are only accessible through Archimer at the moment.

Renewing relationships between research teams and libraries

Research teams are currently heavily using electronic resources (bibliographical databases, electronic journals…) available to them through libraries. The Institute staff rarely or never goes to library facilities. The staff has access to all resources directly at its desk.

This situation is of course real progress. It allows for the entire Institute staff, no matter where located, to have access to a very large part of the documentation made available by the libraries and to benefit from efficient research tools and documents watch (ex: bibliographical database, automatic research alerts/notification…)

On the other end, this situation tends to isolate librarians from research teams who could underestimate the role librarians play on getting access rights to a selection of information sources. For example, we often come in contact with researchers who think scientific publishers' articles found on the Web are free. Since, the access to those publishers' resources is protected through IP address control; researchers are able to access them without realizing how much work it took to negotiate a subscription contract with for instance a publisher like Elsevier.

Setting up an archive is an opportunity for librarians to strengthen their contacts with researchers when, for example, customized collecting of publications to be recorded in Archimer takes place.

Improving Ifremer Internet Web site's visibility

Documents recorded in the Ifremer Archive are, not only, accessible through the Archimer Web site but also though search engines and the OAI-PMH harvesters search engine.

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Archimer end-user statistics show that search engines mainly Google, are the main access points to our documents. They prove the fact that some of the users, who access our documents directly through search engines, continue on their inquiry by going to our Web site Home page. From that page, some look for other documents available via the site. Others continue on browsing by going to the Ifremer Institutional Web site and discover other information related to the Institute.

Documents recorded in Archimer are, consequently, additional new entry points to Ifremer's Institutional Web site. They therefore contribute to an increase in visitors of Ifremer's Web site: an essential communication tool for the Institute.

General Principals

Choosing the development platform

When designing Archimer's system, we made an internal choice using Java, JSP and Oracle technologies, since we originally wanted to reuse part of Archimer's modules in other library projects frameworks, and in particular a Web sites renovation project for catalogue browsing. Furthermore, we hoped to link this new system to other existing computer modules as our Bibliometric database or electronic journals gateway. Focusing on specific development seemed, at the time, to be the best solution to reach our goals.

Web sites included in this project are developed using JSP pages and are carried out through the Ifremer central Apache/Tomcat server. Those technologies were selected for their compatibility with the Ifremer IT department's global policy.

The documents' bibliographical data recorded in Archimer is stored in an Oracle database: data base hosted on a server and mutualised between all of Ifremer's departments. Using Oracle is specifically interesting for Archimer since it allows advanced documentation search functionality integration.

Types of documents recorded

Currently, Archimer is able to record and broadcast theses co-financed by Ifremer, internal reports, conference proceedings and articles published in scientific journals.

In an effort to promote the approval of this project by Ifremer's staff, we first wanted to limit article recording to post-publications only. As of today their free broadcast on the Web is a success as opposed to pre-publications which is sometimes criticized by authors fearing plagiarism where publication quality content is not controlled by peers.

Broadcast format

We chose a PDF format as single format. All documents recorded in Archimer are therefore converted into PDF's; this is so regardless of their word processing tool (Word, Latex…). We selected this format for the following reasons:

- We can be assured of PDF format's permanence, due to its wide use and ongoing publishing of specifications,
- Its implementation is simple, this reduces processing time and document recording in Archimer,
- It is well suited to the electronic broadcast of large files such as publications or theses.

Storing documents

Long term document storing has not been one of our major concerns in this framework. As an example, right from the start we chose not to convert documents into XML/SGML to ensure their permanence. Time spent for such a conversion seemed incompatible with people resources available for the project.

However, when considering the amount of PDF's stored, we assume that if this format was to become obsolete there would be conversion tools available to easily convert those PDF files.

Document recording conditions

Documents are recorded in Archimer by the Institute's librarians who are in charge of:

- Entering metadata,
- Filing documents according to specific topics (ex: biology, aquaculture, fishing …),
- Adding keywords as necessary,
- Full-text formatting and converting into PDF's if necessary,
- Transferring full-texts to Archimer's server.

a) Recording theses, conference proceedings or internal reports

For theses, conference proceedings or internal reports, the authors request for us to record their documents.

In order to broadcast this type of document via Archimer, the authors need to provide us with, by email, the bibliographical data necessary to reference their document. They also need to send full-text Word or PDF documents (according to file sizes) by email or on CDROM.

If the author's full-text document includes one or several Word files, we convert and merge them into one PDF file using the Acrobat program before transferring them to Archimer's server.

b) Recording recent publications

Some of the authors tell us which publications they would like to be broadcast on Archimer. In that case, we check which rules have been set up by the publisher of the publication as far as auto-archiving. If the publisher authorizes auto-archiving, we provide the author with the information we need to record those publications.

However, in order to record and broadcast a greater amount of publications, we do not only count on spontaneous submission by Ifremer authors, but we handle the following watch and collecting:

- Every week, we spot publications written by the Ifremer staff. All of those publications are recorded in Ifremer's Bibliometric Database (see the following chapter).

- We then study each of Ifremer publishers' policy for those publications by using the Sherpa/Romeo Web site. If the author's policy is neither found on his Web site or Sherpa/Romeo, we systematically try to contact the publisher and request the authorization to record his articles in Archimer.

- If the publisher authorizes his own PDF files to be auto-archived (ex: EDP Sciences, The Company of Biologists…) we upload the article's PDF file from the publisher's Web site and record it in Archimer. Most bibliographical data is automatically transferred from the Bibliometric Database to Archimer's. Missing bibliographical data is manually copied from the publisher's Web site. For this last instance, recording is done without having to contact the authors.

- If the publisher authorizes auto-archiving but limits this exemption to his copyright to the author's last draft (the version sent by the author to the publisher: version containing all corrections requested by peers during the proofreading process but which has not been formatted by the publisher), we contact the publication's authors to request that version. If they are able to provide it, we use that version to produce a PDF file matching our broadcast criteria before recording it in Archimer. Two cases can be present :

  o The author submits his publication as one or several Word files (for example, one for text and another for charts and figures) we merge those files before converting them into a single PDF file). We also reformat the first page, not only to standardize our publications, but to also meet publishers' requirements (adding a full and standardized quotation of the publication's quotation, adding a link

> to the publisher's Web site, adding explanatory text specific to each publisher…)

  o The author submits his publication as a PDF file, we reformat the first page before recording it in Archimer.

An archive linked to other La Pérouse library's documental systems
Figure 1 presents the technical structure of Archimer's main modules and how they link to other library documental systems.

Archimer is linked to the Ifremer Bibliometric Database (see fig. 1/5). The purpose of this database is to list articles, published by the Ifremer staff, in peer-reviewed journals. This database has been developed, within the scope of national indicators set up for the evaluation of French research organizations' scientific production. It is fed through the crossing of data exported from the Current Contents Connect® database and Ifremer's LDAP directory (see fig. 1/6 and 7).

To simplify contacts with the authors for those publications, librarians have access to Archimail (see fig. 1/3) which uses the Bibliometric Database. This tool can generate pre-written and personalized messages according to the publication to be processed. When, in the Bibliometric Database (see fig. 1/5), librarians spot an article published in a journal, which publisher authorizes auto-archiving, they simply need to copy the article's identification and paste it in Archimail. With this identification, Archimail retrieves the data necessary to compose the message from the Bibliometric Database, including the publication's title and all of Ifremer authors' email addresses found in the publication. With this information, Archimail composes a message which can be personalized before sending it automatically to all authors found in the article.

To record a new document in Archimer, librarians connect to a Web site (see fig. 1/4) accessible from Ifremer's Intranet. This Web site offers several Web forms that are specific to the types of documents to be recorded (theses, internal reports, publications…).

The document's bibliographical data is recorded on those forms (title, summary, author…) and will be saved in a database (see fig. 1/1). Those forms also allow recording the full text, as a PDF file, which will be stored on the Ifremer Internet server's disk space (see fig. 1/2).

To record a publication already referenced in the Bibliometric Database (see fig. 1/5), librarians can enter the document's identification in this database. This option allows the automatic transfer of available bibliographical data from the database to entry forms. Librarians can then finalize the recording by typing in missing information (DOI, copyright, full-text).

When recording a publication and to automatically obtain data related to the journal in which the article is published, librarians can also do a search in the Electronic Journals Database (see fig. 1/8). This database contains a cumulative list of all titles to which Ifremer subscribes. This way librarians can enter a few words from the title (ex: aqua* liv*), to find the corresponding title and transfer all of that data to entry forms (journal's URL and complete title, publisher's URL and name).

External end-users can look at available documents via the Archimer Web site (see fig. 1/11). In that case recorded documents records are dynamically built through JSP pages according to end-user requests. Those records provide a link to full-text documents (see fig. 1/2).

Every night, a JAVA program (see fig. 1/9) builds a static HTML file for each newly recorded document (see fig. 1/10). This static file provides the document's record as well as a link to the full-text version (see fig. 1/2). Those static files are built for Internet search engine robots (ex: Google, MSN). This way, document records and full-text versions are directly accessible from those search engines.

Archimer is also OAI-PMH compatible. Harvesters and notably Avano, described further on in this document, (see fig. 1/13), can harvest bibliographical data recorded in Archimer by interrogating its OAI-PMH server (see fig. 1/12). Harvesters will therefore be able to feed their own bibliographical data (see fig. 1/14) using references harvested from several archives and offer from their own interrogation interface an access to Archimer's static records (see fig. 1/10).
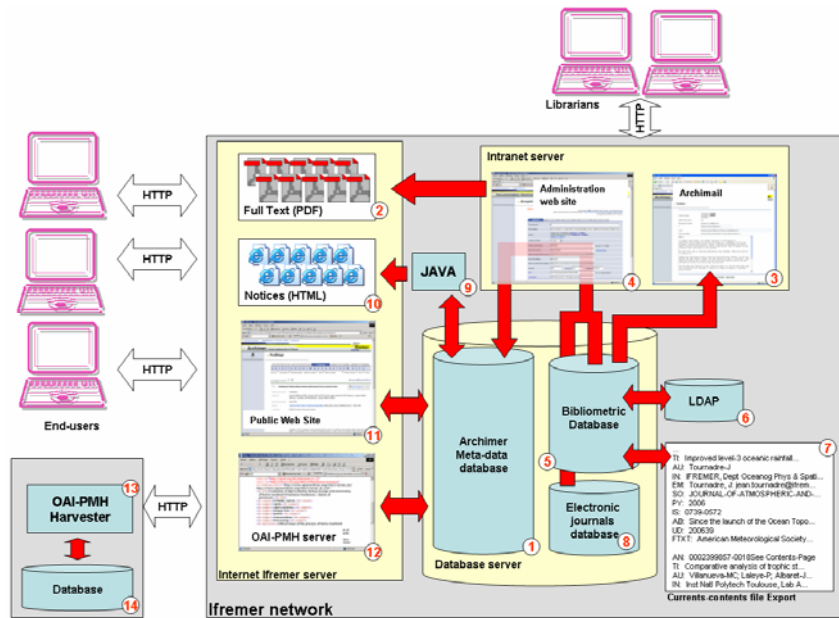
Figure n°1: Archimer system architecture

One year's worth of collecting publications at Ifremer
One year after its opening Archimer offers more than 1,400 documents of which more than 70% of those publications have been written or co-written by Ifremer since August 2005.

From August 1st, 2005 to August 15, 2006, 116 publications with the first Ifremer author have been found in the Current Contents Connect® database. 82 of those 116 publications are already recorded, amounting to about 70%. Those 116 publications can be divided as follows:

- 10 articles were published with publishers who prohibited recording of their publications in an institutional repository (ex: American Meteorological Society, ASLO...),

- 16 articles were published with publishers who authorized auto-archiving of their own PDF files. 8 of those 16 articles are still embargoed. They are recorded but will only be visible in a few months, which should quickly bring the percentage of free access publications to more than **77%**,

- 90 articles were published with publishers who limited auto-archiving rights to publications' last draft. 74 drafts of those 90 articles were collected and recorded.

On a broader perspective, during the same period of time, 257 publications with one or several Ifremer authors, regardless of their position in the authors list, were found in the Current Contents Connect® database. More than 60% of those 257 publications are already access free via Archimer.

Evolution perspectives

Collecting « author versions » publications upon publisher's approval
As of now, few authors spontaneously submit their document to Archimer. We obtained most of the documents currently recorded in Archimer by personally contacting their authors. However, this method has several limitations:

- When we attempt to contact the authors of a publication, they have sometimes already left Ifremer. This can be explained through the fact that more than one year can go by; between the time an article is submitted to a journal to the time it is visible in Current Contents. When a student publishes an article to present his work at the end of his thesis, he often has left Ifremer at the time his article is published and comes up in Current Contents.

- If a publisher only authorizes broadcast of the publication's last draft, at the time we contact the author to get this version, it is sometimes too late due to lost or deleted files.

Therefore we have started to set up systematical collecting for « author versions » as soon as they are accepted by a journal. So, when authors submit their file to us upon publication approval, we can, not only improve Ifremer's publications collecting percentages, but mainly, under reserve of copyright policy compatibility established by the publisher, broadcast « In-Press » publications. We can then be part of speeding the broadcast process of Ifremer's research results, by broadcasting publications several months before they come up on the publisher's Web site.

Spreading the system to other types of documents
As of now, Archimer allows recording and broadcast of theses, post-publications, in-press publications, internal reports, activity reports and conference proceedings. We are planning on integrating other types of documents:
- Patents,
- Posters,
- HDR (Habilitation à Diriger les Recherches ; a French diploma granting a Higher Doctorate degree)

Avano, an OAI harvester for Marine and Aquatic Sciences

Context

One year after the launching of Archimer, La Pérouse Library launched Avano, an OAI harvester specializing in Marine and Aquatic Sciences. This development aims at:

- Continuing on displaying Ifremer's support to the Open Access movement.
- Offering a better visibility of documents placed in Archimer, by aggregating them with papers found in several other archives, in order to create an international database.
- Offering a new centralized tool to the Ocean Sciences community in order to discover data that is currently disseminated throughout many servers.

Functioning principal

Avano is an OAI harvester for Marine and Aquatic Sciences. Therefore, it collects bibliographical data of electronic resources (documentation, images, datasets...) available in a group of Open Archives via the OAI-PMH protocol in order to aggregate them into a centralized database (see fig. 2/3). Its Web interface (see fig. 2/3) offers centralized viewing of resources disseminated throughout several servers.

Avano harvests many archives from Marine Science research institutes. All resources stored in those specialized Marine Science archives are systematically and automatically referenced in Avano. By the end of September 2006, Avano had harvested the following 6 specialized Marine Science archives:

Archive	No. of Doc Available	Description
ArchiMer, Institutional Archive of Ifremer (French Research Institute for Exploitation of the Sea)	1,446	Archimer is the Ifremer Institutional Repository (French Research Institute for the Exploitation of the Sea). It provides free online scientific or technical documents (publications, theses, conference proceedings, etc) in all fields related to oceans (oceanography, aquaculture, fisheries, etc...).
DRS at the National Institute Of Oceanography	418	The National Institute of Oceanography (NIO) in India hosts the Digital Repository Service (DRS) which collects preserves and disseminates institutional publications (journal articles, conference proceedings, technical reports, theses, dissertations,

		etc...).
Marine & Ocean Science ePrints Archive @ Plymouth	1,520	Marine & Ocean Sciences ePrints @ Plymouth is a digital archive providing access to papers produced by the staff of the Marine Biological Association of the United Kingdom, Plymouth Marine Laboratory and the Sir Alister Hardy Foundation for Ocean Science. Marine & Ocean Sciences ePrints @ Plymouth is also an historical archive containing digital copies of early papers from the Journal of the Marine Biological Association of the United Kingdom.
OdinPubAfrica	1,112	Research & Publications in Marine Science in Africa in digital form, including pre-prints, published articles, technical reports, working papers and more.
Repository@NOAA	34	Repository@NOAA (The National Oceanic and Atmospheric Administration) is a searchable database of full-text, online NOAA documents from several selected NOAA programs. The purpose of this project is to establish the feasibility and importance of archiving on a long-term basis full-text NOAA documents in a secure, accessible, and authenticated NOAA electronic repository. The NOAA IR Pilot Project is collaboration between the NOAA Libraries and Information Network, the NOAA Central Library, and the Digital Commons Institutional Repository platform developed by Berkeley Electronic Press.
WHOAS at the MBLWHOI Library	1,190	The Woods Hole Scientific Community Repository, covering Ocean Physics and engineering subjects, Oceanography and Marine Biology

Avano also interrogates a group of open archives not specialized in Marine Science in which are stored, among others, a group of resources linked to Marine and Aquatic resources. For example the ArXiv server specializes in Physical and Mathematical Sciences and contains several publications linked to Oceanography.

Some of those archives let you isolate documents linked to topics of interest from subsets. In that case, you can automatically isolate resources linked to Marine or Aquatic Sciences and make it viewable to Avano users.

To process archives which are not perfectly categorized within our fields of interest (see fig. 2/5), Avano uploads (see fig. 2/6) all of their records in a temporary database (see fig. 2/8).

Those databases are indexed and an automatic system (see fig. 2/9) isolates records that contain one or several terms linked to Marine or Aquatic Sciences (see fig. 2/10).

Records spotted by this key-word system (see fig. 2/11) are then manually validated by librarians (see fig. 2/12) before they can be visible via Avano. To validate those records, librarians use a Web site (see fig. 3). Key-words found in records are highlighted. This system allows librarians to reject index files when key-words are not related to our field of interest (for example when *Fish* is used for *Fluorescence in situ hybridization*).

By the end of September 2006, this key-word research system allowed us to publish more than 25,000 records isolated within more than 1.5 million records and uploaded from 35 non-Marine Science archives
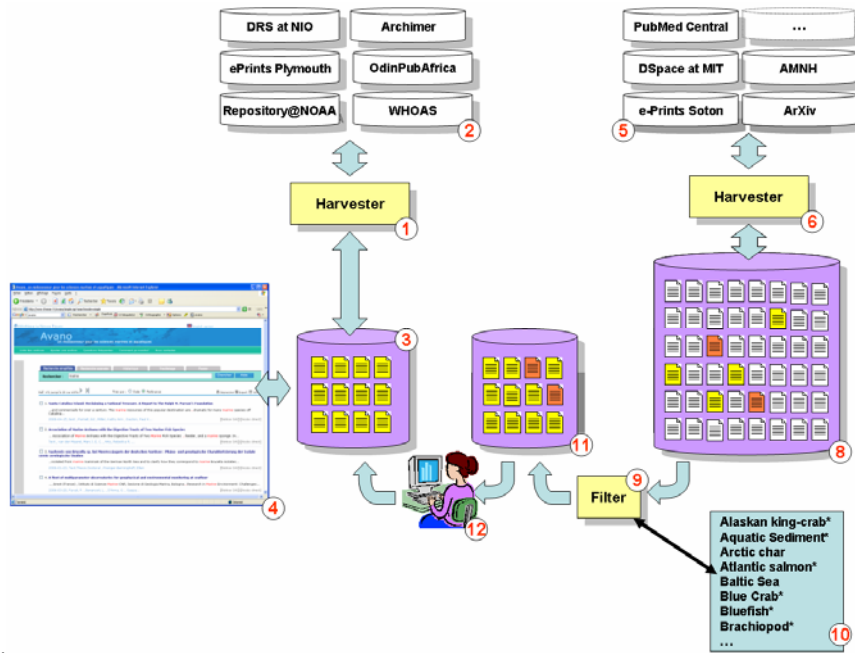

.
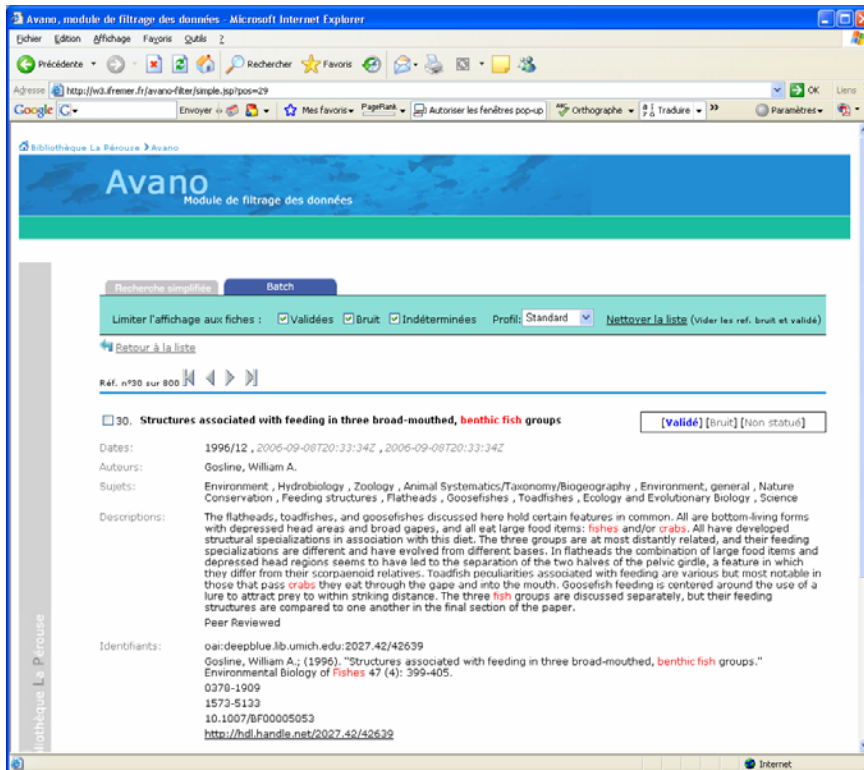*Figure n°2: Avano functioning principal*

Figure n°3: Avano data filtering module Difficulties encountered while implementing Avano

The difficulties we encountered when setting up this archive are mainly linked to the OAI-PMH protocol limitations:

- **Spotting index files corresponding to a theme in an archive**: This has been the main problem we have been facing. There almost has never been a perfectly matching subset for the fields we wanted to isolate in non-specialized Marine Sciences archives. This limitation led to the development of the key-word spotting system described in the previous chapter.

- **Managing deleted files**: Some archives don't keep track of the files their remove from their database. Those archives are then unable to show the collectors which files have been deleted. In this case, collectors, including Avano, can offer index files pointing to deleted resources. To go around this

problem, Avano will have to completely re-harvest those files on a regular basis to spot potential deletions.

- **Managing doubles**: Several research organizations or universities can record the same electronic resource in their own institutional repository. If Avano collects those archives, it will get descriptive index files of the same topic stored in several places. This can happen if for example a publication is written in collaboration with several institutions. If so, this publication may be archived on those institutions' different servers. Considering our current low auto-archiving rate (environ 15%), displaying doubles in the results list is hardly probable, but this problem should increase in the coming years.

- **Determining publications dates and/or types of resources**: In order to respect the OAI-PMH protocol, archives have to expose their data in the non-qualified Dublin-Core DTD. In this DTD all fields are optional. This optional information trait raises several issues especially for the « date » and « type » fields. When an index file does not have a publication date, it is systematically placed at the end of the list when a user requests sorting his result list by date. Just the same, when a user narrows his search to a range of specific dates, those index files are excluded from the search even if they match the specified search requests.

- **Standardizing the « type » field**: Even if the Dublin Core DTD recommends storing the « type of document » information by using standardized text strings, few archives take this into consideration and still present the information as free text (ex: « publication », « artjournal », « text », « article » are used to describe an article). In Avano, we recommend our users to limit their search to one of several types of resources (documentation, image, set of data, video, audio). To set up this filter we had to implement a standardizing system for this data based on key-word recognition in this character string. This standardizing is therefore imperfect and our filter system may exclude resources from the result list when a user narrows his search to one or several types of specific data.

Evolution perspectives

In the next few months, Avano should be able to harvest more Open Archives; hopefully including new archives developed by members of the IAMSLIC, and therefore would be able to offer a greater number of records to its users.

Furthermore, we may consider also harvesting the Private Publishers catalogue. As of today, two publishers (« High Wire Press » and « The University of Chicago Press Journals Division ») already show their publications with OAI-PMH. If other publishers also adopt the OAI-PMH protocol, we may consider integrating a selection of their records, which full-texts would remain accessible through subscription, allowing users to filter and aggregate them with papers that are free through the Open Archive.

Therefore, Avano would soon be able to provide a more complete view of international research in the Marine and Aquatic Sciences fields.

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Collaboration proposition with IAMSLIC

When launching Avano we were pleased to see several IAMSLIC colleagues were interested in this system, among them the initiators of the « Aquatic Commons » project. As a matter of fact we hope that Avano can become a part of that project. In this perspective, we hope to propose to the members of the « Aquatic Commons », even to other IAMSLIC colleagues, joining us for the implementation of this system and in particular for the selection of records originating from non-specialized archives in Marine and Aquatic Sciences.

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Archimer, ou la mise en place d'une Archive Institutionnelle à l'Ifremer. Fred Merceur. [23 November 2005] http://www.ifremer.fr/docelec/doc/2005/rapport-657.pdf

Web sites:

Open Archive Initiative site
http://www.openarchives.org/

Oaister
http://oaister.umdl.umich.edu/o/oaister/

OAI explorer
http://re.cs.uct.ac.za/

PROGRESS IN OPEN ARCHIVES AND INSTITUTIONAL REPOSITORIES: GROWING THE WOODS HOLE OPEN ACCESS SERVER (WHOAS)

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ABSTRACT: The Woods Hole Open Access Server (WHOAS) has been fully operational since July 2005. This institutional repository (IR) contains digital objects including technical reports, theses, peer reviewed papers, pre-prints, books and presentations. It is managed by the MBLWHOI Library to serve the Woods Hole science community. Current content originates from the Marine Biological Laboratory (MBL) and the Woods Hole Oceanographic Institution (WHOI), with future input anticipated from other Woods Hole organizations. This paper outlines the efforts to recruit content for WHOAS, collection development policy changes for paper copies, and changes to delivery services for older Woods Hole content.

If you build it, they will come.

The benefit of IRs is understood by librarians and information specialists. The short list includes archiving in perpetuity the digital output of an organization and providing quick and easy access to information. Contributors also increase the visibility of their work by making it more widely available. Stakeholders know the Library is a trusted information source that will exist beyond the life of the research. Even with these advantages, can we expect researchers to add one more task to their list of to dos? Do they really understand what their copyright agreements allow them to do?

At the MBLWHOI Library the decision was made that library staff would do the initial building of the IR. This includes recruiting content, creating the metadata and loading the files. Authors can self deposit, but at this time all content has been loaded by library staff.

Content analysis –
1190 metadata records as of September 30, 2006
Technical reports and theses - 363
Articles (published version) – 210
Articles (pre-prints) – 189

Books – 63
Presentations/other – 10
Data sets – 2
[IAMSLIC – 353 – loaded by IAMSLIC members]

An analysis of articles published by MBL and WHOI authors indicates that 72% of known articles are eligible for WHOAS according to current copyright agreements, either as preprints or in the final version. 57% of these titles have been loaded into the IR. With no institutional mandates to deposit, permission is requested from authors for each article. By building the IR, demonstrating the advantages, and promoting retention of rights under an amended copyright agreement, we hope to influence the way scientists publish in the future.

Beyond born digital … How many paper copies do we need?

In addition to current digital publications, the MBLWHOI Library is scanning older Woods Hole content and loading the PDFs into WHOAS.

Scanning has begun on early MIT/WHOI theses and submission changes will go in effect this winter that will provide the Library with digital copies of future theses. The internal policy changes required working with the WHOI Graphics Department and Academic Programs Office to ensure a mutual understanding of new procedures and continued generation of required paper copies.

Both Brown and MBL have endorsed deposit of Brown/MBL theses into WHOAS and conversations have begun to establish procedures for theses submission.

Digital copies of WHOI Technical Reports have been submitted since July 2005. In addition the Library has scanned and loaded reports back to 1990.

The resulting policies are saving authors money. With electronic availability in WHOAS, we ceased distribution of paper technical reports to exchange libraries and the number of paper copies for both theses and technical reports held in the MBLWHOI Library has been reduced.

A paper copy of each technical report and thesis will be kept in our climate controlled archive. The question of retaining a circulating paper copy of older scanned reports remains. Right now we have the space to maintain the paper collection and the issue has been raised that some scanned images may not be as clear as the original. On the flip side, we recently received a digital version of a 2003 technical report that was originally sent to the Library as a black and white paper document. The electronic file contained color images, making it the superior version.

On demand scanning

A secondary advantage of maintaining the IR is having a system in place to provide researchers and libraries with older Woods Hole content usually within a couple of days. When we get a request for an MBL or WHOI copyright publication the item is sent to our Digital Processing Center for scanning, and then loaded in WHOAS, usually with in a few days.

Conclusion

By creating and building a sustainable IR, the MBLWHOI Library is archiving the digital output of Woods Hole research, as well as providing timely electronic access to material previously available only in print. Education on rights retention and open access is an important aspect of the Library's mission as we strive to make information accessible to a wider audience.

Relevant websites

DSpace:
  http://www.dspace.org/
WHOAS:
  https://darchive.mblwhoilibrary.org/index.jsp
MBLWHOI Library:
  http://www.mblwhoilibrary.org/
Amendment to Publication agreement:
  http://www.mblwhoilibrary.org/services/copyright/
Journal policies – self archiving:
  http://romeo.eprints.org/

OPEN ACCESS TO LEGACY TAXONOMIC LITERATURE: INDEX ANIMALIUM
&
THE BIODIVERSITY HERITAGE LIBRARY: OPEN ACCESS TO LEGACY LITERATURE

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Abstract : After reviewing taxonomic literature, the principles of nomenclature, and introducing Sherborn's *Index Animalium,* the speakers talk about going beyond page scanning to data parsing and data mining, thus being able to connect users to the literature they need. The Biodiversity Heritage Library, a project to digitize the monographic and serial taxonomic literature is then discussed.

Keywords: Charles Sherborn, Index Animalium, species, taxonomic nomenclature, digitization, bibliographic references, OCLC WorldCat, Smithsonian Institution Libraries, National Museum of Natural History, Marine Biological Laboratory, UBio, Open Content Alliance, Biodiversity Heritage Library

I. *Index Animalium* Digitization Project

> *In any well-appointed Natural History Library there should be found every book and every edition of every book dealing in the remotest way with the subjects concerned. ... Moreover for accurate work it is necessary for the student to verify every reference he may find; it is not enough to copy from a previous author; he must verify each reference itself from the original.[1]*

Charles Davies Sherborn, a noted taxonomist, clearly states the relationship between biological nomenclature and the need to reference published works. Sherborn's *Index Animalium* was, at its time of publication, the definitive index to animal names. This important link between working scientists and the reference materials stored in libraries is the reason for the current work being done to provide greater access to these printed texts. Through the digitizing of Sherborn's *Index Animalium* and the further step of development of a world wide accessible Biodiversity Heritage Library, the Smithsonian is participating in the globalization of these important texts.

A. Binomial *nomenclature*

Binomial nomenclature is the standard convention used for naming species. As the word 'binomial' means, the scientific name of a species is formed by the combination of two terms: the genus name and the species epithet or descriptor. The naming of a species is done by an "author," the person who first publishes the name. The species descriptor should be an adjective that differentiates a species from other members of a genus. The genus name and species descriptor are usually derived from Latin but more modern naming conventions have developed to be more "Latin-like." Geographic features (cities, mountains, rivers, etc.) are used to form the description or some are named after prominent people. For example**,** F. Christian Thompson, a USDA entomologist, described and authored a flower fly, which he named after Bill Gates: *Eristalis gatesi.* (Bill's fly is only found in the high mountain cloud forests of Costa Rica).

Established rules exist for the proper naming in the various fields of study. But in every field, zoology to botany, the name is considered established once is has appeared in a published document. Rules established in the *International Code of Zoological Nomenclatur[2]e* state that the documents must be distributed in at least five major, publicly accessible libraries. This creates a logical, clear, and important tie between the library community's stewardship of printed, published documentation to the scientific community in the taxonomic field. Taxonomic literature never goes out of "style". It remains necessary and even at times more important as it gets older.

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[1]Charles Davies Sherborn, Epilogue to *Index Animalium*, March 1922.
[2] http://www.iczn.org/iczn

B. The *Index*

Charles Sherborn was a cataloger at heart. He examined relevant text looking for names, creating a hand written card index that was useful as soon as he started. Published between 1902 and 1933 in two section comprised of 33 parts, the *Index Animalium* covers a range of species and genera names giving the exact location of the name in the published text. Smithsonian Institution Libraries has completely digitized Sherborn's *Index Animalium* providing scanned images of the pages and searchable database of the information. Currently, staff at the Smithsonian is in the process of deciphering the abbreviations used by Sherborn and making the logical and explicit connection between the references to bibliographic records for each text cited.

A typical Sherborn entry:

albimanus Delphinus, T. R. Peale in Wilkes, Expl. Exped. VIII. 1848, 33

Sherborn's index differs from traditional citations by giving the species name first. The dolphin *Delphinus albimanus* was authored by Titian Ramsey Peale. Peale named it for the first time in the eighth volume of Charles Wilkes' multivolume publication *United States Exploring Expedition*. Volume 8 was published in 1848 and Peale's description and name for this species is on page 33.

The Atherton Seidell Endowment Fund of the Smithsonian Institution supported the Smithsonian Libraries in converting the OCR text to 99.997% accuracy. SIL worked in collaboration with a team from the Marine Biological Laboratory at Woods Hole to take the re-keyed text and parse the data[3]. David Remsen and Patrick Leary had worked on a similar text, Neave's *Nomenclator Zoologicus*[4]. Remsen and Leary used a combination of PHP routines and regular expressions to create a database fielding the names, the authors, the publications and other information from Sherborn's text.

C. Bibliographic connections

The bibliographies of *Index Animalium* hold particular interest. All the texts consulted by Sherborn, monographs and journals, are listed. Sherborn used non standard abbreviations for the titles and publishers making it difficult to identify which text he examined. The goal of the bibliography abbreviation project is to create a full citation for each of the text mentioned in the *Index Animalium* bibliographies, and to provide a connection to a full bibliographic record for the title. Once identified, the title and author are searched to find linkable bibliographic descriptions of the text in SIRIS[5], the Smithsonian's online

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[3]SIL is posting images of the pages as well as pictures of pages because these systematists and taxonomists care to see exactly what was published noting errors of Sherborn and errors of the publishers.
[4]http://www.ubio.org/NomenclatorZoologicus/
[5]Smithsonian Institution Research Information System. http://www.siris.si.edu/

catalog, and OCLC's WorldCat. The final web product will link the users from the citations and bibliography to the texts in the Smithsonian collection and to WorldCat's worldwide library catalog.

Screen shot of Bibliography Abbreviation Project:

Original Text	Full Title	Authorized Name	OCLC	SIRIS
Richardson, John. Fauna Bor.-Amer. 4 pts. Lond. 1829-37. [Quadr. June 1829 ; Birds, Feb. 1831 ; Fish, 1836 ; Ins. 1837.[,,Yes	Fauna boreali-americana; or, The zoology of the northern parts of British America: containing descriptions of the objects of natural history collected on the late northern land expedition, under command of Captain Sir John Franklin.	**Richardson, John, Sir, 1787-1865.**	4055433	185713
Riedel, W. Die Grasmucken.... 8vo. Nördl. 1833. [B. M., no n. spp.],,	Die Grasmücken und Nachtigallen in Europa, oder, Vollständige Naturgeschichte dieser vorzüglichsten Singvögel :nebst Zaunkönig und Goldhähnchen : mit besonderer Rücksicht auf Fang, Zähmung, Pflege, Wartung, Nutzen und Vergnügen : ein unentbehrliches Han	**Riedel, Wilhelm, Pfarrer in Pfuhl**	19469019	364051
Risso, A. Ichthyol. de Nice. 8vo. Paris, 1810.,,	Ichthyologie de Nice, ou Histoire Naturelle des Poissons du department des Alpes Maritimes.	**Risso, A. (Antoine), 1777-1845**	19469044	364052

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II. *Biodiversity Heritage Library Project*

> *Yet another physical difficulty is the task of assembling the library and indexes which will enable the student to work under proper conditions….The beginner must now be prepared to spend liberally, or else must establish himself in an institution where a large library exists; if he work by himself with only a few books, he will have to confine himself to a very narrow specialty indeed.*[6]

James M. Aldrich, a Smithsonian entomologist quoted above, had a dream to bring together all the taxonomic publications into one large library. The Convention of Biological Diversity held in Darwin Australia, February 1998 noted in its Darwin Declaration of Life[7] that the existing information held in the literature and by current experts should be made available electronically. Modernizing this dream, the Biodiversity Heritage Library (BHL) was formed to create a digitized, virtual collection of taxonomic literature. The *Index Animalium* will provide a basis of texts to be used – ideally, every publication listed in *Index Animalium* will be digitized accessible through the BHL.

A. Example of successful digitization

The Smithsonian has found that digitizing texts and making them available over the World Wide Web has been incredibly beneficial to researchers world wide. It provides a "repatriation" of information to areas of the world that do not have access to those legacy texts describing their own biological diverse ecosystems. *Biologia Centrali Americana*, a multivolume compendium of the biodiversity of Mexico and Central America at the turn of the 19th century, has only few complete copies in North America, fewer in Europe, and only two in Central America. The two in Central America are housed in Smithsonian facilities. This limited distribution has been solved by providing the digitized text.[8] This allows researchers in the field to access data, though possibly through very slow connections, directly instead of requiring very long distant traveling to the few institutions that hold the hard copies of these types of materials.

B. History

The idea of providing as much data as possible to scientists where ever they maybe doing research is not new. In 2003, a meeting took place in Telluride, Colorado to discuss the potential of creating Edward O. Wilson's concept of the "Encyclopedia of Life:"

> Imagine an electronic page for each species of organism on Earth, available everywhere by single access on command. The page

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[6]"The Limitations of Taxonomy" by J.M. Aldrich, *Science*, April 22, 1927, vol. LXV, no. 1686, p.381.
[7] http://www.biodiv.org/programmes/cross-cutting/taxonomy/darwin-declaration.asp
[8] e-Biologia Centrali- Americana http://www.sil.si.edu/digitalcollections/bca/

contains the scientific name of the species, a pictorial or genomic
presentation of the primary type specimen on which its name is
based, and a summary of its diagnostic traits. [9]

In February of 2005, a meeting took place in London: "Library and Laboratory: the
Marriage of Research, Data and Taxonomic Literature." From that meeting, natural
history librarians took the idea of a combined digital library to Washington in May of
2005. Ground work for the Biodiversity Heritage Library grew from that and has
continued with an organizational and technical meeting again in Washington the summer
of 2006. The goal of having information linked providing seamless access for users to
look up species, verify information in texts, link to updated species information,
references to historic usage of names, accurate images of species, and even geographic
distributions is not as far off as it seems.

C. BHL Membership

BHL consists of five large natural history museums: American Museum of Natural
History (New York), National Museum of Natural History, Smithsonian (Washington,
D.C), Natural History Museum (London), and the Field Museum (Chicago). Three major
botanical gardens: Missouri Botanical Garden, New York Botanical Garden, and the
Royal Botanic Garden, Kew. Botany Libraries and the Ernst Meyer Library of the
Museum of Comparative Zoology at Harvard University are also members. The
informatics member is the Marine Biological Laboratory / Woods Hole Oceanographic
Institution Library (Massachusetts). Partnering for digitization is the Internet Archive
(San Francisco).

BHL is also a part of the Open Content Alliance [10]. A major mandate of the BHL and
OCA's digitization efforts is to provide open access. The plan is to include all material
that is out of copyright and having the "opt in" model (not the Google "opt out" model)
for publishers of currently held copyrighted materials.

D. Taxonomic Intelligence

The uBio initiative at the Marine Biological Laboratory Library is an international effort
to create and utilize a comprehensive and collaborative catalog of known names of all
living (and once-living) organisms. [11] UBio's algorithm for harvesting taxonomic
binomial names from OCR text and adding and comparing it to their growing Name Bank
of species names allows for taxonomic identification. This allows for synonym
reconciliation – and even has vernacular tools, Roman and Non –Roman script

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[9] E.O. Wilson, "The Encyclopedia of Life". http://www.all-
species.org/fall/references/EncyclopediaofLife.pdf
[10] http://www.oca.org
[11] http://www.ubio.org/

capabilities – and then connects the information to other taxonomic sources such as ITIS or Species 2000.

In the above example, a sample text is put through the tool; working against the NameBank list of over 9.5 million names, nearly 1,000 new names were located and over 17,000 new access points (valid names, synonyms, vernacular terms, common misspellings, etc.) are now available to the researcher. The displays also allow browsing of texts by taxonomic tree sets.

E. Future Goals of BHL
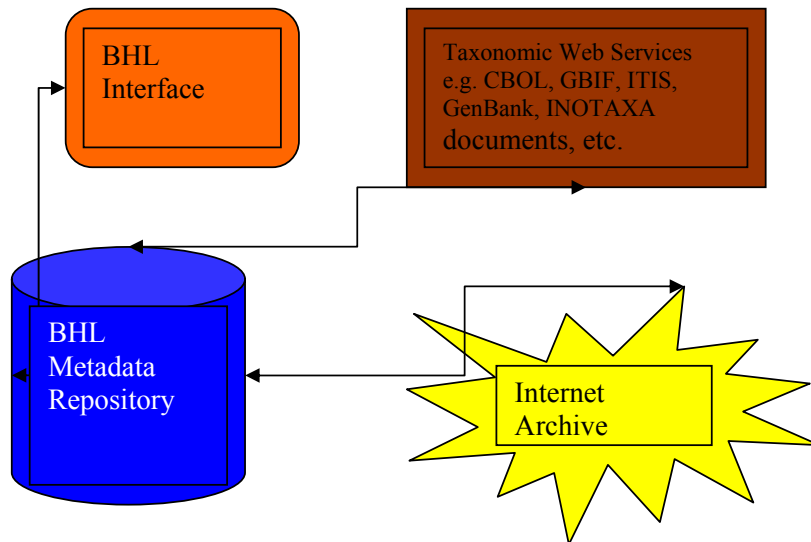
A very simplified schematic of BHL indicates that there maybe many ways to access the information. BHL will have an interface or portal, but the data will be available for other services to use the data exposed by the BHL. The metadata repository will hold the title level description, plus some granular level identification needed for taxonomic citation (volumes, issues, etc.). The metadata repository can point to the files stored at the Internet Archive. These files will include the scanned images, OCR text and other related files.

Chris Freeland, of the Missouri Botanical Garden, has designed a prototype of what the BHL interface might include. The wireframe holds scanned images, navigational menus, and functions for ways of capturing, storing and printing out materials.

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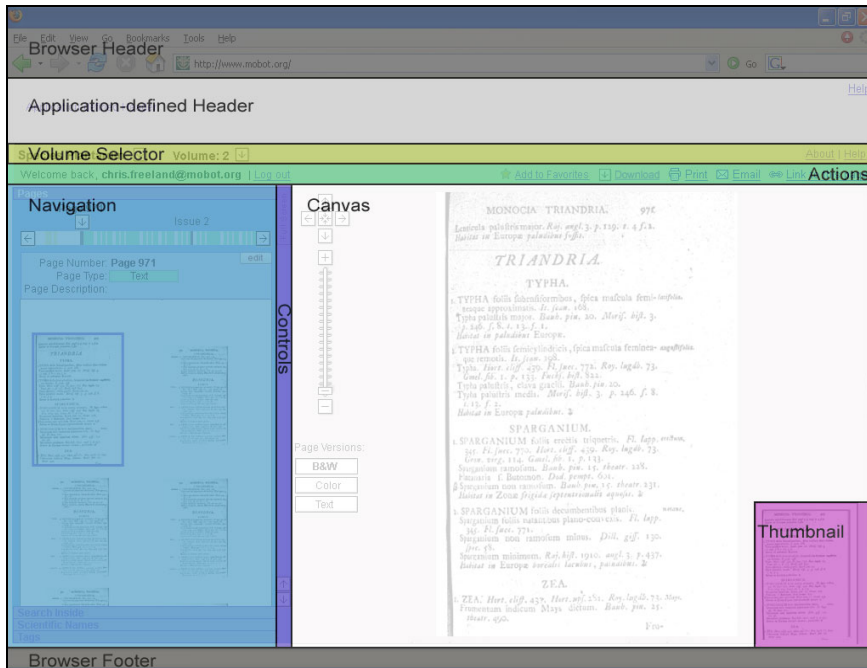
The short term goals for the BHL project are to continue the analysis of the metadata from the member institutions. Development of scanning workflow and plans are being discussed as are the locations of potential high production scanning stations.

Long term goals for BHL include fostering relationships with scholarly publishers of current taxonomic journals; working on the metadata needed at the levels of citation in taxonomic texts; integrating with proposed the Encyclopedia of Life; work with the international biodiversity organization, GBIF; and coordinate efforts with global taxonomic databases such as Consortium for the Barcode of Life and the National Center for Biotechnology Information's GenBank.

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Biodiversity Heritage Library. http://www.bhl.si.edu/

Universal Biological Indexer and Organizer (UBio). http://www.ubio.org/

http://www.sil.si.edu/staff/2006IAMSLIC/PortlandIAMSLICPresentationfinal.pdf

IAMSLIC AND INTERNATIONAL SCIENTIFIC ORGANIZATIONS: AN APPROACH TO TRANS-PACIFIC INFORMATION EXCHANGE

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International organizations like IAMSLIC serve an important service in forging collaborations across borders, but their effectiveness can be limited by the breadth of membership. Opportunities to develop collaborations with other organizations, in this case international scientific organizations, hold the promise of synergistically addressing the missions of both organizations.

In the 1980s, an effort was made to establish a "Center for Marine Science Information Exchange" by the Scientific Committee on Marine Science of the Pacific Science Association (PSA – *www.pacificscience.org*). Academician Viktor Ilyichev, director of the Pacific Oceanological Institute (PIO) in Vladivostok, USSR, and chair of the committee, worked to establish the Center at his institution, with scientific materials being submitted by committee members from countries around the Pacific Basin. The nominal purpose of the center was for collation, dissemination, and exchange of scholarly output in marine science. The proposed benefits were to i) increase awareness of research across the Pacific and ii) to create linkages, partnerships, and collaborations among member nations and institutions. There may have also been some unstated benefits, including improving the availability of scientific literature to Soviet scientists and, in the era of *glasnost*, to promote publications by Soviet scientists in the international refereed literature.

Despite many members submitting materials to the Center, it failed to fulfill its goal, and was deemed a failed effort. The reasons are likely quite diverse, but some of them include the following:
- No strong proponents providing continuous support;
- A lack of commitment from the parent organization;
- A lack of timeliness in receipt or response (the materials that were distributed were copied in mimeograph);
- A lack of awareness of the Center by potential users; and
- A lack of commitment from the partners.

While the degree to which the PIO library staff was involved is unknown, I would contend that the lack of involvement by professional library staff in the member nations at the outset contributed to this failure. This is often a common fate in international organizations – there is no lack of good ideas, but often a lack of commitment and follow-through.

The objectives of the Center were good ones, but the effort may have been premature. Times have changed since the mid-80s; new publication, information, and communication technologies, as well as new organizational structures, present new opportunities. IAMSLIC already provides many of the linkages, but in some countries of the North Pacific, broader membership by marine science librarians would strengthen the function. An opportunity to collaborate with an international organization is presented by PICES, the North Pacific Marine Science Organization *(www.pices.int)*. PICES is an intergovernmental scientific organization established in 1992. Its current member countries are Canada, Japan, Peoples' Republic of China, Republic of Korea, Russian Federation, and the US. As elaborated in its strategic plan, selected objectives pertinent to potential collaboration include:

- Promote and coordinate marine research in the North Pacific and adjacent seas;
- Advance scientific knowledge about the ocean environment, global weather and climate change, living resources and their ecosystems, and the impacts of human activities; and
- Promote the collection and rapid exchange of scientific information on these issues.

PICES publishes extensively, both with in-house documents and in refereed journals (often from workshops and scientific sessions at the annual meeting). A recent annual meeting in Honolulu included 11 scientific sessions, 6 workshops, 403 registered participants from 12 countries, 227 oral presentations, 122 posters and 7 electronic posters. PICES is dedicated to capacity building in its member nations, and information exchange can play a role; there is no formal participation, however, of the marine science librarians in the member nations in PICES activities.

A challenge is presented to IAMSLIC as an organization; engage PICES as an example of how marine science libraries can work with international organizations to achieve objectives in marine science information exchange. Strong potential exists to activate linkages with Russian, Chinese, Korean, and Japanese marine science libraries, and PICES can assist in this communication; the net result will be to strengthen both PICES and IAMSLIC as organizations. IAMSLIC should discuss and identify a cooperative role consistent with its own aspirations as well as with PICES strategic plan elements. It could lay the groundwork with colleagues in PICES member nations. To move forward with this activity, IAMSLIC should attend the 2007 PICES annual meeting in Victoria as a "cooperating organization," learn more about the organization, and propose mechanisms to move forward with collaborative efforts.

A COMPARATIVE ANALYSIS OF PRIMARY LITERATURE DATABASES FOR FRESHWATER BIOLOGY

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Abstract:

There are a bewildering array of databases currently available for literature searches. Major, traditional indexes to the primary literature of freshwater biology include: Aquatic Sciences and Fisheries Abstracts, Biological Abstracts, Biological and Agricultural Index, CAB Abstracts, CSA Biological Sciences, Fish and Fisheries Worldwide, Web of Science, and Zoological Record. New indexes and search engines have recently appeared; notably Scirus, Scopus, and Google Scholar. Large electronic journal packages that can function as indexes and provide significant access to the primary literature of freshwater biology include: BioOne, Blackwell Synergy, JSTOR, SpringerLink, and Elsevier ScienceDirect. All of these electronic databases (along with an interdisciplinary, undergraduate oriented, full text database, EBSCO Academic Search Premier) were compared and ranked using quantitative and qualitative criteria and search results based on the various chapter topics and content within *"Current and Selected Bibliographies on Benthic Biology"*; which is published annually by the North American Benthological Society. Overall the top five databases for freshwater biology, based on the bibliography content and criteria examined in this analysis, were: Google Scholar, Web of Science, Scopus, Zoological Record, and Biological Abstracts.

The University of Montana is a medium sized (almost 12,000 FTE), research oriented, public university. The University of Montana, Maureen and Mike Mansfield Library is a medium sized (1.4 million volumes), academic library. The Mansfield Library, like many similar sized academic libraries, has greatly increased access to databases (electronic indexes and ejournal packages) over the last few years. Access to journals has changed over the last 7 years from about 4,500 print subscriptions available in the library building

to over 20,000 ejournals available 24 hours a day, anywhere, to University of Montana student, staff, and faculty members. This is the result, to a large extent, of consortial, long term, contracts. Library users appear to be in a golden age of access.

The Mansfield Library, like many other medium sized university libraries, has hundreds of databases and arranges them on web pages alphabetically, and in department/ subject categories subdivided with two different listings of "try these resources first" and then "related resources" with titles and brief descriptions. Someone looking for an appropriate database for searching freshwater biology literature is faced with a bewildering array of choices. Major, traditional indexes to the primary literature of freshwater biology include: Aquatic Sciences and Fisheries Abstracts (ASFA), Biological Abstracts, Biological and Agricultural Index, CAB Abstracts, CSA Biological Sciences (which includes Aquatic Sciences and Fisheries Abstracts), Fish and Fisheries Worldwide, Web of Science, and Zoological Record. Some newer indexes and search engines that have recently appeared and are available include: Scirus, Scopus, and Google Scholar. Large electronic journal packages, listed amongst the databases, that can function as indexes (and some of which provide keyword searching of article full text) and provide significant access to the primary/ journal literature of freshwater biology include: BioOne, Blackwell Synergy, JSTOR, SpringerLink, and Elsevier ScienceDirect. Finally, there are number of interdisciplinary, undergraduate oriented, full text databases such as EBSCO Academic Search Premier which are presented as good places to start any literature search.

With so many database choices the obvious question arises of whether some databases are better than others for the general subject of freshwater biology or is one as good as another? Given some search term flexibility they certainly all will find something on most freshwater biology topics. One might suspect that many library users, and even librarians, select databases for literature searches based on past experience, familiarity, habit, availability, and/or the name and brief description of the database, or its web page listing order. Few users are likely to rigorously compare databases using standard criteria and evaluate results to determine the best information resource for a particular topic or discipline. And new databases may have a harder time getting used or reviewed adequately.

Surprisingly, there are few published studies in the library literature on database comparisons for particular disciplines using objective, content criteria. Several studies have looked at the overlap of coverage between selected, traditional science indexes (Bearman and Kunsberger 1977; Poyer 1984; Chisman 1989; Hughes 2001). Fewer studies have used specific criteria and evaluated indexes (Jatkevicius 2000; Parker 2005). The overall conclusion of most science index comparison studies is that there is a maximum of 60 to 70% overlap between indexes, and researchers should use multiple indexes for literature searches. Parker (2005) notes that Web of Science "remains a perennial favorite of scientists" and was included in her study "solely to prove that it should not serve as an ultimate resource for marine scientists". There are a number of reviews comparing Web of Science and Scopus (e.g. Deis and Goodman 2005; Dess 2006) which often can be boiled down to a recommendation of "keep Web of Science

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and buy Scopus if you can afford to". And there are now many reviews of Google Scholar (e.g. Jacso 2005) typically pointing out its limitations (unknown and incomplete content); DeGuire (2006) states that "…Google Scholar will never be able to replace abstract databases…". In contrast a report by OCLC (2005) indicated that, based on an extensive survey, the vast majority of information consumers begin their information searches with search engines not library web sites, and that "….search engines deliver better quality and quantity of information than librarian-assisted searching and at greater speed….".

A survey of the top 5 databases for freshwater biology, was administered at the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) Conference, October 2006, Portland (Appendix 1). A survey sheet was distributed with a list of databases and librarians were asked to rank 1 through 5 (with 1 being the best). Based on 33 individual responses the top 5 databases for freshwater biology, as perceived by IAMSLIC attendees are listed below.

Top Databases for Freshwater Biology as Identified by IAMSLIC Conference Attendees:
1st) ASFA
2nd) Biological Abstracts
3rd) Web of Science
4th) Scopus
5th) Google Scholar

What content source should be used for an objective comparison and ranking of freshwater biology databases? The North American Benthological Society (NABS), founded in 1953 and international in membership, is arguably the premier society for scientists engaged in freshwater ecosystem science research. There are several publications put out by NABS including an annual bibliography (Current and Selected Bibliographies on Benthic Biology). The 2004 NABS Bibliography (published in 2005) was selected for this analysis and every citation in it was reviewed. This annual bibliography has individual chapters (18 chapters in the 2004 bibliography), each prepared by different authors who are typically expert in the field, with organismal coverage (e.g. chapters on periphyton, plecoptera, etc.) and environmental coverage (e.g. chapters on general aquatic ecology, macroinvertebrate toxicology, etc.). The chapters vary greatly in length (e.g. 1 page versus 19 pages in the 2004 bibliography). The content is primarily journal articles (the 2004 bibliography contained 3,990 journal articles out of 4,333 total citations). And the content is very diverse (citations were identified from over 850 different journal titles).

Given that the NABS bibliography is a good benchmark for analyzing freshwater biology databases what criteria should be used as measurements? Criteria, based on the NABS bibliography, that were identified for this analysis are as follows: Are the top journals indexed?; Is the most recent issue indexed for the top journals (and if not how long is the lag time)?; Are the specific citations indexed?; What is the amount and relevance of literature indexed matching topics found in the bibliography?

To identify the top journals in the 2004 NABS bibliography a straight count could be used (Appendix 2). However, given how greatly the chapters vary in length using a straight count might bias the identification of the top journals based on an individual chapter topic (e.g. Odonatologica, International Journal of Odonatology). Instead, to calculate the top journals overall for the 2004 NABS bibliography each chapter was examined, and the top 10 journals (based on number of citations) for each chapter were identified, and then those journals listed in the top 10 for 3 or more chapters were selected. There were 12 journal titles appearing in the top 10 for 3 or more chapters (out of 108 different titles from the combined top 10 lists of all chapters) and those are listed below (in ranked order with ties generating the same number order). Hydrobiologia was ranked number 1 for almost half the chapters of the bibliography (9 out of 19). The list of top journals based on a straight count (Appendix 2) was similar to the list below with 8 identical journal titles (out of the top 12 journals). The top journals listed below do not correlate well with the journals identified in the marine and freshwater biology category of the 2005 Journal Citation Reports as ranked by highest impact factor (e.g. Hydrobiologia is ranked 42nd out of 77 journals in that category by impact factor).

1) Hydrobiologia
2) Archiv fur Hydrobiologie
3) Freshwater Biology
3) Journal of the North American Benthological Society (JNABS)
5) Environmental Toxicology and Chemistry
6) Aquatic Insects
7) Journal of Freshwater Ecology
8) International Review of Hydrobiology
8) Journal of Great
8) Zootaxa
11) Canadian Journal of Fisheries and Aquatic Sciences
12) Entomological News

The databases were evaluated to determine coverage of the top 12 journals and results
(i.e. the number of the top 12 journals not indexed) are listed and ranked below:

Database	# of Top 12 Journals Not Indexed
1) Google Scholar	0
1) Scopus	0
1) Web of Science	0
1) Zoological Record	0
2) ASFA	2
2) Biological Abstracts	2
2) CAB Abstracts	2
2) CSA Biological Sciences	2
3) EBSCO Academic Search Premier	6
3) Fish & Fisheries Worldwide	6
4) Biological & Agricultural Index	11
4) BioOne	11
4) Blackwell Synergy	11
4) SpringerLink	11
5) Elsevier Science Direct	12
5) Scirus	12

The databases were evaluated to determine how current the indexing of the top 12
journals is and results are listed (i.e. average # months behind) and ranked below.

Database	Average # Months Behind for Journals Indexed
1) BioOne	0
1) Blackwell Synergy	0
1) Science Direct	0
1) Springerlink	0
1) Scirus (NA)	0
2) Biological & Agricultural Index	1
3) Web of Science	1.16
4) EBSCO Academic Search Premier	1.33
5) Scopus	1.75
6) Google Scholar	4.16
7) Zoological Record	4.58
8) CAB Abstracts	5.1
9) Biological Abstracts	5.8
10) CSA Biological Sciences	6.4
11) ASFA	8.3
12) Fish & Fisheries Worldwide	11.33

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A random number generator was used to select 20 numbers between 1 and 4,333. Each number was then used to find a correspondingly listed citation within the bibliography. The databases were evaluated to determine the number of the 20 citations indexed and the results are listed (i.e. # of citations not indexed) and ranked below.

Database	# of Citations (NABS Biblio) Not Indexed
1) Google Scholar	2
2) Scopus	4
2) Zoological Record	4
3) Biological Abstracts	5
3) Web of Science	5
4) CSA Biological Sciences	9
5) ASFA	11
6) Fish & Fisheries Worldwide	14
7) EBSCO Academic Search Premier	15
7) Scirus	15
8) CAB Abstracts	16
9) Elsevier Science Direct	17
10) BioOne	18
11) Biological & Agricultural Index	19
11) Springerlink	19
12) Blackwell Synergy	20

Ten keyword searches were crafted to capture NABS bibliography chapter topics. Six of the ten topics were organism oriented and four were concept oriented. Results were limited to the year 2004. An example of an organism oriented search was:
Keyword: plecoptera* or stonefl*
Limits: 2004-2004.

Searches were adapted to database interfaces. The databases were evaluated to determine number of results and relevance of results. Relevance was determined by examining the first 10 citations and noting the number of citations deemed likely to appear in the NABS bibliography. The procedure was admittedly subjective. The database ranking based on the number and relevance of results is listed below.
1) Google Scholar
2) Scirus
3) Biological Abstracts
4) Web of Science
5) CSA Biological Sciences
6) Fish & Fisheries Worldwide
6) Zoological Record
7) ASFA
8) Scopus
9) EBSCO Academic Search Premier

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10) CAB Abstracts
11) Elsevier Science Direct
12) BioOne
13) Biological & Agricultural Index
14) Blackwell Synergy
SpringerLink – NA (couldn't apply searches)

To determine a final database ranking each of the four categories of criteria examined were equally weighted with 12 points each for a total of 48 points possible. Results were assigned point values within each category. The category for number of top journal titles not indexed had 0 points assigned for 0 journals not indexed and 12 points assigned for 12 journal titles not indexed. The category for number of months behind current journal issues indexed had an average for all journal titles with 0 points assigned for 0 time lag and 12 points assigned for 12 months or greater time lag. The category for number of the 20 citations not included had 0.6 points assigned for one citation not included and 12 points assigned for 20 citations not included. The category for number and relevance of keyword searches had an evaluation that resulted in rankings of 1 through 16 for each database and then assignments of 0.75 points per ranking. The final database ranking is listed below. If the fourth category of number and relevance of keyword searches is removed the same top ten databases remain with the only difference being that Scopus and Google Scholar switch rankings.

Top Databases for Freshwater Biology (based on the results of this study):
 1) Google Scholar
 2) Web of Science
 3) Scopus
 4) Zoological Record
 5) Biological Abstracts
 6) CSA Biological Sciences
 7) ASFA
 8) Scirus
 9) EBSCO Academic Search Premier
 10) CAB Abstracts
 11) Fish and Fisheries Worldwide
 12) BioOne
 13) Elsevier Science Direct
 14) Biological & Agricultural Index
 15) Blackwell Synergy
 16) Springerlink

Conclusions from this study include: top databases identified for freshwater biology are in general agreement with the collective judgment of IAMSLIC conference attendees on 4 out of 5 databases; Google Scholar performed better than expected but had a surprising lag time of several months for indexing current journal issues; some traditional indexes

performed better than expected and others worse than expected (depending on individual expectations!); not surprisingly publisher ejournal packages did not perform well. Google Scholar is still only listed as being in "beta" version; undoubtedly many traditional, specialized, commercial indexes may face increasing competition in the next few years with users preferentially selecting Google and Google Scholar for literature searches. It is worth periodically testing and reexamining assumptions about databases.

An obvious critique of this analysis would be the subjective nature of assessing the amount and relevance of citations indexed in databases matching topics found in the NABS bibliography. No rebuttal is offered; that is why the total ranking was assessed both with and without the literature amount and relevance measurements included (and the top ten databases stayed the same in both scenarios with only slightly different ranking results). Critiques of this analysis might also include a concern about what databases were originally used by the authors of the NABS bibliography (i.e. if Web of Science, as a perennial favorite of scientists, was primarily used to generate most of the citations in the NABS bibliography and analyzed in this study, then of course Web of Science would be identified as one of the top databases). That is an important concern however, using a bibliography with 18 authors from 18 different institutions makes it extremely unlikely that the same tool was used by all authors for finding literature. Furthermore, scientists often find literature not through indexes or databases but rather via personal networks, known authors, known journals, and the bibliographies in journal articles. One additional database that ideally should have been evaluated as part of this study is Aquatic Biology, Aquaculture and Fisheries Resources. A final concern might be the "macroinvertebrate-centric" nature of the NABS bibliography. An argument could be made that while no bibliography is comprehensive, the NABS bibliography has a very wide scope and given the fundamental position of macroinvertebrates in ecosystem studies most aspects of freshwater biology are covered each year in it. Nevertheless, an additional comparative analysis ideally should be performed using a freshwater "fish-centric" bibliography and the results compared with this study.

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Appendix 1: Librarian Survey of Top 5 Databases for Freshwater Biology (administered by Barry Brown at IAMSLIC Conference, October 2006, Portland during his presentation). Survey sheet was distributed with list of databases shown below. Librarians were asked to rank (1 through 5) the top five databases (with 1 being the best). Number of responses and numeric responses for each database are listed below; X indicates a circled nonranked response. There was a total number of 33 submitted surveys.

ASFA: 2, 2, 1, 3, 3, 1, 3, 1, 2, 1, 3, 1, 2, 2, 2, 2, 2, 1, 1, 3, 2, 1, X, X, X, X, X, X, X

Biological Abstracts: 1, 1, 1, 1, 5, 4, 1, 2, 2, 4, 1, 3, 2, 3, 1, X, X, X, X, X

Biological & Agricultural Index: 2, 2, 3

BioOne:

Blackwell Synergy: 4, 3

CAB Abstracts: 1, 2, 1, 5

CSA Biological Sciences: 2, 2, 1, 3, X, X, X, X

Fish and Fisheries Worldwide: 2, 1, 4, 4, X

JSTOR: 5

Google Scholar: 4, 3, 3, 4, 3, 3, 3, 4, 2, 2, X

ScienceDirect: 3, 4, 1, X

Scirus: 1, 5, 3, X

Scopus: 1, 3, 2, 2, 1, 4, 2, 5, X, X

SpringerLink: 5, 5

Web of Science: 3, 2, 4, 2, 3, 3, 1, 2, 3, 1, 1, 3, 2, X, X, X

Zoological Record: 2, 1, 4, 4, X, X

Appendix 2: Top 20 Journals in the 2004 NABS Bibliography as identified by total citation count of all chapters.
Hydrobiologia (295)
Freshwater Biology (131)
JNABS (110)
Archiv fur Hydrobiologie (90)
Environmental Toxicology & Chemistry (63)
Journal of Freshwater Ecology (56)
Journal of Great Lakes Research (43)
Zootaxa (40)
Odonatologica (38)
Ecology (35)
International Journal of Odonatology (35)
Marine & Freshwater Research (34)
Canadian Journal of Fisheries & Aquatic Sciences (33)
Environmental Pollution (32)
International Review of Hydrobiology (32)
Transactions of the American Fisheries Society (32)
Aquatic Insects (31)
Aquatic Ecosystem Health & Management (30)
Ecological Applications (30)
Archives of Environmental Contamination & Toxicology (28)

INTERNATIONAL UNION OF FOREST RESEARCH ORGANIZATIONS AND FORESTRY LIBRARIANS

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ABSTRACT: *The International Union of Forest Research Organizations (IUFRO) is a global network whose aim is to foster cooperation among researchers in all areas of forestry and related sciences. Provided here is an overview of the IUFRO organizational structure and goals in general, and those that relate to information management in particular. Highlighted are the history and the recent accomplishments of Divisions 06.03 whose charge is centered on information services and knowledge organization within the forestry research community. Current issues facing forestry librarians are noted as is the need to take a fresh look at their role within IUFRO.*

KEYWORDS: IUFRO, Forests and Forestry, International Librarianship, Oxford Forestry Information Service, Global Forest Decimal Classification.

Introduction

"Trying to describe the Canadian forest is like trying to describe the sea.
You see it but you can't hold it with a look;
You admire it even as you fear it;
It seems the same, but is constantly changing;
It's quiet on the surface, but ready to burst into a torrent of flames.
It is vast, diverse, living and working." [1]

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[1] Taken from *The State of Canada's Forests 2001-2002*

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For a librarian, the International Union of Forest Research Organizations (IUFRO) bears some resemblance to the forest as described above. It is a vast organization which serves to connect researchers from opposite sides of the world who are working on common research problems. Its changing scope and organization has provided catalogers with challenges for several decades. From its earliest years, it has also acknowledged the importance of organizing research information about forests and forestry for the future.

The intent of this paper is to give an overview of the larger IUFRO organization but concentrate on IUFRO Division 6.03 and its sub-divisions which center on information services and knowledge organization. Also presented are some of the issues facing forestry librarians and the possible limitations of IUFRO as a vehicle for addressing these issues.

IUFRO Today:

IUFRO is a global network for forest science cooperation. While other international organizations are involved in forest research including the Centre for International Forestry Research (CIFOR) and the World Agroforestry Centre (formerly the International Centre for Research in Agroforestry), IUFRO is the only organization that attempts to bring together research organizations, universities and individual scientists from throughout the world to address research questions and share new research findings. As such, IUFRO unites more than 15,000 scientists in almost 700 member organizations in more than 110 countries. It is a non-profit, non-governmental organization, open to all individuals and organizations dedicated to forests and forest products research and related disciplines.

Founded in 1892, it has a long history of promoting international forest science cooperation though it is important to note that cooperation within IUFRO is strictly voluntary. The IUFRO vision for the world's forests is that they will be managed in a sustainable manner for economic, environmental and social benefits. Inspired by this vision, IUFRO works towards achieving its mission which is to promote global cooperation in forest-related research and to enhance our understanding of the ecological, economic and social aspects of forests and trees as well as to disseminate scientific knowledge to stakeholders and decision-makers so as to contribute to forest policy and on-the ground forest management.

In pursuing its mission, IUFRO has identified three strategic goals and related objectives for the period 2006-2010:

- To strengthen research for the benefit of forests and people by addressing changing research needs; promoting quality research and strengthening the administrative, financial and legal foundations
- To expand strategic partnerships and cooperation by enhancing interdisciplinary cooperation; expanding partnerships and collaboration and strengthening cooperation within and between regions

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- To strengthen communication and links within the scientific community and with students as well as with policy makers and society at large by enhancing communication within the scientific community and increasing interest and involvement of students in forest science; strengthening links between science and policy and by increasing public awareness about forest science

The scientific activities of IUFRO members is spread over eight permanent "divisions" each covering key forest research fields:

1. Silviculture
2. Physiology and Genetics
3. Forest Operations Engineering and Management
4. Forest Assessment, Modelling and Management
5. Forest Products
6. Social, Economic, Information and Policy Sciences
7. Forest Health
8. Forest Environment

The main function of these divisions is to support researchers in their collaborative work and to provide an organizational link among "research groups" and "working parties." This thematic structure brings together researchers who have a similar interest but work under different economic, political and environmental conditions. In total, there are about 280 research groups and working parties each addressing specific topics.

"Task forces" are established on a temporary basis for inter-disciplinary cooperation in inter-divisional forest research fields. Currently these include:

- Communicating Forest Science
- Endangered Species and Nature Conservation
- Forests and Carbon Sequestration
- Forests and Genetically Modified Trees
- Forests and Human Well-Being
- Forests and Water Interactions
- Forest Science-Policy Interface
- Illegal Logging and FLEGT
- Traditional Forest Knowledge

The aim of each task force is to strengthen IUFRO activities in a specific area.

"Special programmes" and "special projects" provide services that support the science collaboration in IUFRO. A special programme is a long-term activity with the aim of improving networks, research capacities and/or information exchange. Special projects are short term activities with specific objectives. Programmes and projects currently in process include the IUFRO Special Programme for Developing Countries, the SilvaVoc Terminology Project, the IUFRO Special Project on World Forests, Society and Environment, and of particular importance to librarians looking for forestry information, the Global Forest Information Service (GFIS).

GFIS is an initiative of the Collaborative Partnership on Forests (CPF) and is hosted by the FAO at: http://www.gfis.net/gfis/. The GFIS gateway provides access to catalogued information resources through metadata harvesting. It is a partnership of information providers and it provides an open exchange standard for its information categories. The standard is based on the Dublin Core Metadata Initiative (DMCI) and on AGRIS (FAO) metadata schemas. The website provides full documentation on the information exchange standard, as well as a control panel where partners manage their contribution details. Browsing and metadata search facilities allow the user to locate forest related information through a single entry point. Resources that can be located via GFIS include maps, datasets, web resources, as well as traditional print documents relevant to their forest information needs. GFIS also maintains and publishes a database of partner information services, as well as a Google-based search tool.

The interested researcher within IUFRO member organizations has access to a global network of forest research and related sciences. Member organizations receive documentation from the IUFRO Secretariat including an electronic newsletter, annual report, World Forestry Congress proceedings and brochures. Membership guarantees unrestricted access to the IUFRO website (www.iufro.org) via membership login and access to information on the IUFRO World Congress, Projects and Programmes, on-line databases and online publications. Member organizations may add a link to their homepage on the IUFRO website and individuals associated with member organizations may represent IUFRO at regional, national and international forums.

The Role of Librarians and Information Specialists in IUFRO

A simple look at the IUFRO website (http://www.iufro.org/) hides the extent of specialization discussed above. Take a deeper look at Division 6 (http://www.iufro.org/science/divisions/division-6/), which is devoted to Social, Economic, Information and Policy Sciences and you get a sense of the overall structure and level of specialization that runs throughout IUFRO. Within Division 06, Section 03 is devoted to "information services and knowledge organization." This seemingly small portion of IUFRO has an impressive history related to the dissemination of forestry information in the twentieth century.

In order to appreciate this history, let us go back in time 100 years. The then, "Association" of Forestry Research Organizations, is just over 10 years old. At its third meeting, attendees observe the need to compile a bibliography of past and current forestry research.

In 1906, at the fourth meeting, the International Committee on Forest Bibliography is formed. It is also decided that the system used to organize this bibliography should be Dewey based and that this ongoing activity needs a permanent home or secretariat.

By 1908, this secretariat is authorized and set to be located at the Swiss Federal Institute of Forest Research at Birmensdorff. The decision is made to take subscriptions in order to maintain a current bibliography in the form of a quarterly magazine and also, to compile and publish references to the literature back to 1750 in book form.

Unfortunately the First World War puts a stop to this activity. Discussions do not resume until 1922 by which time the subscription funds have suffered from inflation and are gone. Without funds, the future of a permanent secretariat in Switzerland is in question. But soon, R. S. Troup a professor of forestry at Oxford University takes over as Chair of the Bibliographical committee. This move of the committee chair to Oxford begins a more or less permanent connection between Oxford and what is now known as Division 06.03.

Professor Troup sees the need to create an extended version of the Dewey Classification Scheme to aid in organizing material in a forestry specific bibliographic clearinghouse. Thanks to the work of Philipp Flury (Birmensdorff), who is serving as secretary of the Bibliographical Committee, the *Forest Bibliography* takes shape. In 1933, it is published in German, the language of forest research at the time. Three years later it is translated into French and English. It is widely referred to as the "Flury system" and authors are encouraged to add "Flury" numbers as keywords to their articles. At Oxford, the Flury system is immediately adopted by Professor Troup to organize references in the *Current Monthly Record* and in library catalog.

As the system grows and more material is amassed, maintenance of these services proves too much for only 1.5 staff. In response, with the full support of IUFRO, Oxford invites, the abstracting organization, the Imperial Agriculture Bureaux (now CAB), to form a new bureau for Forestry at Oxford. Their offer is accepted in 1938. This allows the Oxford Forestry Institute Library to continue as an archive and clearinghouse while the Imperial Forestry Bureau provides full indexing for each item received.

In 1939, as the Second World War begins, so does the publication of *Forestry Abstracts* taking the place of the *Current Monthly Record* but continuing to serve the original goal of the Bibliographical committee. The Second World War also marks the end for any effort by IUFRO to create a separate secretariat, for its bibliographic endeavors.

After WWII, with the IUFRO clearinghouse role falling by default to the Oxford Forestry Institute Library (OFI) in collaboration with the Imperial (later the Commonwealth) Forestry Bureau, an extensive library of international forestry material is amassed there. Today the OFI library receives over 2000 current forestry serials of which some1900 are donated. This strong collection is due, at least in part, OFI's historical connection to early researchers via IUFRO.

In 1949, the bibliographical committee is revived as the Joint FAO/IUFRO Committee on Forest Bibliography and becomes IUFRO Section 01. Soon after, the *Oxford System of Decimal Classification for Forestry* is finalized. This extensive revision of the "Flury"

system is published by CAB in 1953 and is adopted by both IUFRO and the FAO. Later, the Joint Committee takes on the publication of a multilingual terminology which is completed in 1971 and published by the Society of American Foresters.

By 1972, IUFRO is again restructuring, an activity that has made it a nemesis of catalogers and serial librarians. The Joint Committee, IUFRO Section 01, becomes Section 6.03 covering "information systems and terminology." A much needed revision of the *Oxford Decimal Classification for Forestry* is undertaken in 1981 by S6.03. It is published in 1990 and the word "oxford" is dropped from its title. Since then, the primary changes within Section 06.03 have been the addition of four sub-divisions in 1995 and, an effort to have the division names more accurately reflect current needs and words like networks, services, and knowledge organization are added to those of longtime "products" like terminology and classification.

IUFRO Section 06.03 today:

Many recent activities have served to further the current goals of Section 06.03 which are listed below:
- to create networks among information professionals
- to coordinate efforts in the field of information services
- to contribute to the organization of knowledge through terminology, classification and indexing
- to evaluate and introduce latest technologies in communication and information services
- to strengthen the geographical diversity of information exchange, partly through partnerships

In 2002, Division 06.03.01, led by Carol Green, initiated the formation of an online *International Directory of Forest Information Services* available at http://iufro.andornot.com/ and hosted by ANDORNOT Inc. on behalf of IUFRO. The only other international directory of forestry libraries at that time was compiled by Peter Evans and published by the US Forest Service in 1982 with revisions in 1987 and 1991. Carol solicited five volunteers to serve as regional coordinators. They helped encourage people to add information about themselves and their collections to the directory. In the future, these regional coordinators could also be used to facilitate the updating of these entries. As of 2004, there were 130 collections registered, including several IAMSLIC members

Issues of terminology have been a concern of IUFRO since the late 1960's. More recently, Section 06.03.02 has promoted what it calls "terminological awareness" by maintaining an online *Directory of Experts* who will answer questions related to terminology by email, phone or fax. This section also holds electronic conferences to inventory the extent of divergence for selected concepts such as old-growth, reforestation, and forest health and contributes terminology to the SilvaTerm Database one of the SilvaVoc Project initiatives.

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Division 06.03.03, led by Barbara Holder, has the most long-lived effort -- the maintenance of the classification schema for forestry now called the *Global Forest Decimal Classification* (GFDC). The most recent update of this schema was completed in late 2005, and published in spring of 2006 as No. 19 of the *IUFRO World [publication] Series*. The GFDC serves as the official Universal Decimal Classification expansion for 630, or forestry. Published first in English and German, French and Spanish translations are in process. Updating the GFDC is a collaborative process. An online toolkit is available (http://iufro.andornot.com/GFDCToolkit.aspx) for suggesting new concepts and sharing editing suggestions. The toolkit is hosted by Andornot Inc. on behalf of IUFRO.

Section 06.03.04 defines itself regionally to include Latin American and the Caribbean and maintains an active network of contacts via regional meetings. While to date, IUFRO has been structured by subject to serve researchers, this regionally focused subdivision may provide a needed precedent for librarians in IUFRO in the future.

Communication within Division 06.03:

Coordinators of 06.03 sections have planned two international conferences during the past 4 years – both joint efforts. The first centered on issues of Interoperability and was planned with the computer and data keeping arm of IUFRO, Division 04.03.03. The second was the centennial celebration for the Oxford Forestry Institute. E-mail and web-conferencing served as the primary means for organizing these meetings. But coordinators of the division and its sub-divisions also try to meet in person annually in conjunction with some conference of mutual interest. In the North American Pacific Northwest, the annual Pacific Northwest Forestry Librarians Meeting has served as a convenient venue to keep up with IUFRO 06.03 division activities and to share concerns about the issues facing forestry librarians.

Issues of concern today:

Issues facing forestry librarians are in many respects common to subject specialists and special librarians in other fields as well. First, there is the growing lost of expertise and institutional memory as specialized forestry collections decline in number or are subsumed within larger collections due to funding constraints and lack of space. Though it has a semi-autonomous web presence as the Oxford Forestry Information Service, even the Oxford Forestry Institute Library no longer stands alone but is part of the Oxford Biological Sciences Library. Likewise there is a growing loss of "forestry librarians" (at least at academic institutions) as the need to serve interdisciplinary institutional goals broadens their subject focus and position descriptions to include, for example, the "natural resources."

As more is available electronically the day-to-day visibility of historical collections declines. Somewhat ironically, even as references to discrete items within these older collections increases as a result of access to online bibliographies, that interest in the

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"tree," as it were, can serve to hide the information "forest" that surrounds it. As a result, the perceived relevance of sustaining the "library" as an information resource comes into question. Finally there is the bourgeoning issue facing many librarians of locating, archiving, and providing a permanent home for research findings that are borne digital but housed very locally.

Whether IUFRO 06.03 is the right organization to address some of these issues is less clear than the fact that to date IUFRO has demonstrated a solid history of concern for the organization of forestry information globally. In the past, its success in addressing this concern resulted in large part from the prominent roles played by the Oxford Forestry Institute Library and the Commonwealth Forestry Bureau. In the last century these roles seemed to fit well with the mission of these two institutions and at a time when research findings needed to be organized centrally to be "findable," researchers in member organizations of IUFRO likely found this mediated, centralized model a better fit as well. But whether it is a model that will work in the future is the question.

Future needs and the role of IUFRO in addressing these issues:

In the future, forestry librarians currently active in IUFRO may have to create a different model, one that builds on their rich history of accomplishments but is more effective in fostering librarianship and better sharing of distributed resources. Such a model will likely require collaboration with other organizations.

To begin addressing the question of how to proceed in order to better serve the current and future needs of forestry librarians and their clientele, it seems useful to consider some of the services IUFRO is not offering currently.

In order to accomplish this, an important first step would be contacting as many forestry librarians as possible and creating a global network of forestry librarians. For this the *International Directory of Forest Information Services* and the Latin American and Caribbean Information Systems Network Sub-Division should prove invaluable resources. The next step might be to set up a listserv to which these librarians could subscribe.

Once the listserv is in place discussions could start concerning activities such as organizing regular meetings for these forestry libraries and establishing a Z39.50 distributed library. Likewise the issues related to collaboration with other library organizations (e.g. IAMSLIC, SLA, the Council on Botanical and Horticultural Libraries and the European Botanical Horticultural Libraries Group) could be addressed.

Funding issues unique to IUFRO:

Setting up services incurs costs and not surprisingly, lack of funds is an obvious barrier. But the structure of IUFRO offers some very specific hurdles related to funding Division 06.03 activities. The IUFRO membership fee is generally borne by the organization not

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the individual and it only covers the cost of running the Secretariat in Vienna which among other things organizes the World Forestry Congress on a five year cycle. Furthermore, IUFRO Divisions cannot charge a subscription nor keep their own bank account. There are no individual 'members' as such in IUFRO and all staff of any institutional member of IUFRO may attend IUFRO group events. IUFRO tradition revolves around meetings being hosted and paid for voluntarily by the institutions organizing the meeting. While the Oxford Forestry Institute and CAB International have provided such an institutional affiliation in the past and are important collaborators, this role needs to be distributed to address global needs in the future. So finding a vehicle for even minimal funding is a challenge.

A few options come to mind as possible ways to get around the funding problem. At one extreme would be to abandon IUFRO and attempt to establish a new international forestry library organization. An alternative would be to find or establish a 'parallel' librarian group to which Division 06.03 could affiliate. Most participants in IUFRO Division 06.03 participate in other professional library organizations, though not the same groups. A variation of these two options would be the establishment of a "forestry" interest group within an existing library organization. Finally, IUFRO Division 06.03 could reorganize to include more regional divisions and push the affiliation "problem" down to a more local level.

While the solution is yet to be formulated let alone realized, the history of IUFRO does provide a certain confidence that obstacles can be overcome. Likewise, IUFRO provides a rich tradition of collaboration among forest researchers and so it is tempting to think librarians will find a way to make this organization work for their contributions to forestry as well.

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What Do Members Want From IAMSLIC?

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The Survey:
An individual email was sent to each current IAMSLIC member. Those who did not respond to the first email were contacted again. A total of 115 (40%) of the IAMSLIC members responded to the five question survey.

Membership Benefits:
Some respondents chose the MOST important benefit of the five options listed, but the vast majority could not limit the choice to a single benefit. The percentages listed below can be compared among the five benefits listed to determine their relative importance to members, but should not be construed to mean the overall importance of a benefit. Clearly, communication was the reason IAMSLIC was established and continues to be important to many members.

•Resource Sharing	57%
•Duplicate Exchange	27%
•Communication	71%
•Conference	46%
•Aquatic Commons	33%

IAMSLIC Benefits
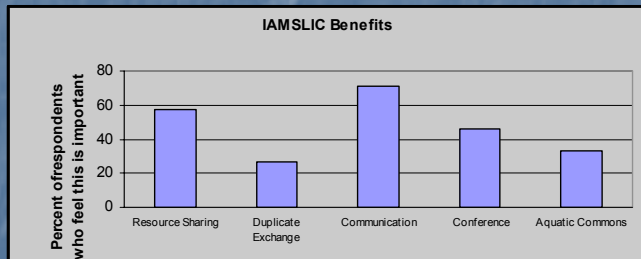
IAMSLIC Conferences:
51% of respondents can attend conferences regularly
62% of non-attendees cited cost as their reason for not attending
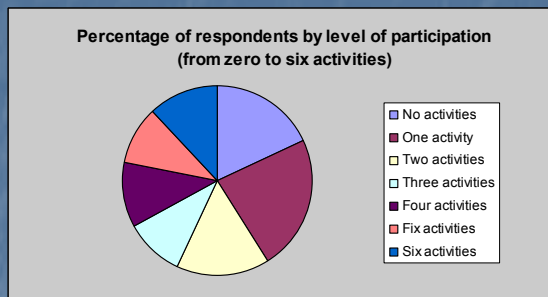13% of non-attendees cited institutional policy or other conflicts

While 51% of respondents can attend conferences regularly, cost is a major barrier to many. Even though it was not asked as part of the question, twelve respondents (20% of members who can attend conferences) mentioned that they pay for some or all of their travel expenses. If we had specifically asked this question we would undoubtedly have learned that even a higher percentage of conference attendees must personally pay some or all of their travel expenses, so conferences must be as economical as possible.

Participation in the organization:
70 percent of respondents listed IAMSLIC as their major professional organization. Members were asked to indicate which of six IAMSLIC activities they participate in:

•Member of a regional group (56%)
•Resource sharing user (51%)
•Union List or Z39.50 Distributed Library supplier (31%)
•Duplicate exchange participant (28%)
•Discussion list member (42%)
•Conference attendee (40%)

23 percent of respondents were involved in only one of the six IAMSLIC activities listed, and another 18 percent did not report participating in any of the activities, indicating that many members may be involved in IAMSLIC for a single very specific benefit. In contrast, the 12 percent of respondents who reported being involved in all six IAMSLIC activities would indicate that for some members ALL aspects of IAMSLIC activities are important to their jobs. Finally, the range of participation as reflected in the pie chart below indicates the variety of organizations involved in IAMSLIC.

Percentage of respondents by level of participation (from zero to six activities)

Legend:
- No activities
- One activity
- Two activities
- Three activities
- Four activities
- Fix activities
- Six activities

IAMSLIC Membership Dues:
80 percent of respondents would be willing for dues (developed nations) to increase to support additional activities. Of those who responded positively, suggested increases were:

•More	21%
•$45-50	50%
•$75	26%
• Other	3%

Other Services Members Would Like:
•Additional tutorials on the IAMSLIC website
•Information on Open Access
•List of experts for training or consulting (Arial, EndNote, etc.)
•Tapes IAMSLIC Conference sessions
•Knowledge transfer (internships/professional visits)
•Digital repository (Aquatic Commons)
•Address language barriers within IAMSLIC
•Do something about the high cost of journal subscriptions
•Consortial purchase of e-journals
•Hands-on training at conferences
•Small-group discussions at conferences
•Strengthen services we already have
•Live-chat reference
•Self-help group for e-publication matters
•Virtual posters at conference (non-attendee presentations)
•Consortial purchase of ASFA
•Grant writing tutorial

Conclusions:
Members are happy with current services and resources, but have also identified some possible new services as well.

Long time member Cathy Norton sums it up by saying:
"I think IAMSLIC is the BEST organization for anyone who is serving the marine science and fisheries communities in the area of libraries and information retrieval -- Actually I go further and say this should be a requirement for any librarian who works in this area -- ALL of the participants in the organization are helpful and more than generous with their time to other colleagues and institutions when help is needed. I think we should reach out into the IT community in our discipline and bring them into the IAMSLIC fold. I think our dues are a "paltry sum" and should be increased to $50.00 at the very least! So, as my brother used to say… run that up the flagpole!"

WHAT DO MEMBERS WANT FROM IAMSLIC?
[Poster]

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Abstract:
Members were asked, via email, to answer five questions to help the IAMSLIC Executive Board with their long-term planning. 115 members (40% of the membership) responded. Benefits considered to be important to members (by percentage) are communication (71%), resource sharing (57%), conferences (46%), and Aquatic Commons digital repository (33%), and duplicate exchange (27%). Just over half (51%) of respondents are able to attend IAMSLIC conferences and cost was the major deterrent to attendance. IAMSLIC is the major professional organization for 70% of the respondents and the major activities participated in by members are (by percentage), regional group (56%), resource sharing user (51%), discussion list member (42%), conference attendee (40%), Union List and Distributed Library supplier (31%), and duplicate exchange participant (28%). 80% of respondents were willing to have IAMSLIC membership dues increased and over 50% of those who responded positively felt that dues could easily be increased to $50 per year for those in developed nations. Additional training opportunities were identified by members and suggestions were forwarded to the IAMSLIC Executive Board.

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