VISUALIZING A BRIGHT FUTURE

Proceedings of the 39th IAMSLIC Conference
Dania Beach, FL USA

Editor:
Dorothy Barr

39th IAMSLIC Annual Conference
Held 20-24 October 2013
In Dania Beach FL USA

Conference Convener:
Sally Taylor

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IAMSLIC
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DEDICATION

Over the course of the past year, several long-time members of IAMSLIC have retired. They are:

Peter Brueggeman
Marcia Croy-Vanwely
Carla Robinson
Murari Tapaswi
Susan Weiss
Craig Wilson

We thank them for their past service, and wish them all the best in retirement.
# Proceedings of the 39th Annual Conference of IAMSLIC

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IAMSLIC 2013, Dania Beach, Florida, USA

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After going north to Alaska in 2012, we headed to the southern US in 2013 to sunny Florida. The weather didn’t disappoint, despite a couple of drenching rainstorms, and we were right on the beach, always a treat. But the best treat was the conference itself. Our speakers challenged us to Visualize a Bright Future, and we came away inspired to make that future happen.

Local arrangements were outstanding as always; many thanks to the team members who made it happen. Next we move across the world to New Caledonia where new adventures await – and new friends and old.
INTRODUCTION

Sally Taylor
IAMSLIC President 2013/2014
39th IAMSLIC Annual Conference Convener

The 39th IAMSLIC Annual Conference held at Nova Southeastern University's beautiful new Center of Excellence for Coral Reef Ecosystems Research in Dania Beach, Florida was a wonderful experience for more than 60 attendees from 15 US states and nine other countries.

The theme of the conference was “Visualizing a Bright Future.” Though the current reality for many libraries is not always sunny, our presenters shared excellent examples of how they are transforming their libraries and championing new roles for information professionals in such areas as data management, research dissemination, instruction and outreach.

In addition to panel discussions, presentations, posters and green flash talks by IAMSLIC members, we enjoyed hearing from two NSU Oceanographic Center scientists, Matthew Johnston, who spoke about web-based software development and data visualization, and Dr. Sam Purkis, who presented on coral reef remote sensing. Two of our major sponsors, Gerald Sawchuk of Cengage Learning, and Matthias Seaman and Ian Stewart from Inter-Research, spoke on how vendors are dealing with our changing world.

This conference was special for two reasons. First the newly created Joint IODE/IAMSLIC Group of Experts on Marine Information Management held their first ad hoc meeting. Related to this collaboration, IODE and IAMSLIC co-sponsored a pre-conference workshop on data management planning led by Jennifer Walton of the Marine Biological Laboratory / Woods Hole Oceanographic Institution Library. NSU has a wonderful facility, and Jen’s workshop was enhanced by one of the largest cruise ships in the world floating past the floor-to-ceiling windows.

Second, we held the inaugural Aquatic Commons work party, and it was beyond successful! Sixteen volunteers spent an afternoon submitting Gulf and Caribbean Fisheries Institute Proceedings to the repository under the guidance of Joan Parker and Pauline Simpson. It was an opportunity to gain hands-on experience with Aquatic Commons and to contribute to its growth. A few weeks after the conference, Alan Allwardt, Jean Collins and Pauline Simpson had completed the editorial review, and the Aquatic Commons was richer by over 600 documents. It shows what we can do when we work together.

IAMSLIC conferences afford the opportunity for rich discussion, much of which happens informally during social events. This year, we spent an afternoon at the International Game Fish Association, and enjoyed a wonderful banquet and dance on top of the Hyatt Regency Pier Sixty-Six Hotel. Those who opted for the field trips learned about local flora and fauna at Flamingo Gardens and the Billie Swamp Safari. The latter offered thrilling airboat and swamp buggy rides.
The conference was a resounding success because of the efforts of our fabulous local hosts, Jaime Goldman and Keri Baker; the conference planning committees; our committed sponsors; and of course, the presenters, moderators and attendees. Thank you all!
PRESIDENT’S WELCOME

Maria Kalentsits
IAMSLIC President, 2013
Food & Agriculture Organization of the United Nations (FAO)
Fisheries and Aquaculture Branch library
Rome, ITALY

Next year, IAMSLIC will celebrate its 40th anniversary. As an organization, we have reached considerable new heights and met many challenges over the past years.

The first IAMSLIC conference was held in October 1975 in Woods Hole, MA, USA. Since that very first meeting, almost 40 years ago, IAMSLIC members have met every year to discuss topics of mutual interest, to share their ideas and concerns, to establish new professional contacts and develop new partnerships. IAMSLIC conferences have always been a success thanks to many enthusiastic members from different countries who volunteered their time and efforts for planning and organizing meetings, preparing presentations, and chairing sessions and panels. IAMSLIC conferences have been held in North and Latin America, Europe, Africa, Australia and Oceania. We are truly an international organization with several regional groups and many active members on every continent. Thanks to Pauline Simpson, who came up with the idea of visualization of the IAMSLIC membership, and Steve Watkins, who put this idea into life, you can now easily find your or any other IAMSLIC library on the Membership’s map. This map made me feel proud that I am part of a professional network ... a network that is spread over the globe and that still has a huge potential for growth in some regions.

I’d like to mention progress achieved by our regional groups, two of which – EURASLIC and SAIL - held their conferences earlier this year. Members of regional groups are actively contributing to the work of many IAMSLIC Committees and Task Forces during the inter-sessional period. And we are also looking forward to establishing an Asian Regional Group and to promoting IAMSLIC resource sharing activities in this region.

I would also like to mention a personal achievement by Janet Webster, who has recently been awarded 2013 Distinguished Service Award by the Oregon Library Association. Congratulations, Janet!

In the past year we have strengthened our cooperation with the IOC International Oceanographic Data and Information Exchange Program (IODE) through the establishing of the Joint IODE/IAMSLIC GE-MIM. Participation in the GE-MIM provide IAMSLIC with the opportunity to communicate needs and priorities of marine libraries to high-level policy makers at the national level as well as to jointly develop global marine information management services and products.
We all know it is not an easy time for marine and aquatic libraries. We are facing continuous budget cuts; several libraries have already been consolidated into centralized facilities or are undergoing consolidation right now. Libraries lose positions and subscriptions. But at the same time that we are facing new challenges we are implementing new technologies and concepts and looking at new ways to provide our services. Is there a space for decentralized services in the overall trend for optimization of investments? Has the embedded librarianship model found many supporters and followers among marine and aquatic libraries? Our 39th conference addressed many of these questions and provided opportunities to discuss these topics during coffee breaks and informal conference events.

I would like to take the opportunity to thank the Conference Planning Committee headed by Sally Taylor and the Local Organizing Committee, chaired by Jaime Goldman, for their hard work and effort in planning and coordinating IAMSLIC’s 39th Annual Conference.
INVITED SPEAKER

THE LION, THE WEB, AND THE GLOBE:
WEB-BASED SOFTWARE DEVELOPMENT AND DATA VISUALIZATION

Matthew Johnston
Research Scientist/Scientific Computer Programmer
NSU Oceanographic Center
PANEL: EMBEDDED LIBRARIANSHIP

Moderator: Kristen Metzger, CSA Ocean Sciences, Inc., Florida, USA

EMBEDDED LIBRARIANSHIP IN ENVIRONMENTAL CONSULTING; AND THE “GOOD NEWS” ABOUT THE DEEPWATER HORIZON OIL SPILL

Kristen Metzger
CSA Ocean Sciences, Inc.
Florida, USA

Abstract:
As one of the two IAMSLIC members working in a for profit environment, I want to illustrate in this presentation the role of an embedded librarian in the corporate world, where you must deliver a visible contribution in a performance and measurement oriented environment. I am not there to provide instruction on how to find information – I’m to find it and deliver it – yesterday! I am truly embedded with the scientists, technicians and managers I serve – my office is in the center of the main building, while the library itself, containing enormous amounts of grey literature, is on the second floor of another building. Information services are provided from before a job is bid to the end point where the final printed product is provided to a client. I provide competitive intelligence and opportunity alerting services before the bidding process. Database searching, evaluation and synthesis of available literature, interlibrary loan and document delivery contribute to the reports written by the scientific staff members. Finally, I assist the document production team in verifying that all bibliographic data is accurate. I’m also involved with internal information architecture and responsible for current awareness. I’ll use the Deepwater Horizon oil spill to show how this event affected environmental consultants, oil companies, municipal, state and federal government agencies and my work as an embedded librarian.

Keywords: Embedded librarian, oil spill, environmental consulting, Deepwater Horizon, competitive intelligence.
PANEL: Embedded Librarianship

COMMUNICATING SPILL SCIENCE: COAST AT THE GULF COAST RESEARCH LABORATORY (GCRL)

Joyce M. Shaw
Jessica A. Kastler
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Abstract:
COAST (Community Outreach for Accurate Science Translation) is a project developed by the Gulf Coast Research Laboratory’s Marine Education Center to serve as the public outreach component of an EPA grant “Uptake and Effects of Dispersed Oil Droplets and Emulsified Oil by Estuarine Crustaceans in the Gulf of Mexico” shared by Skidaway Institute of Oceanography, GCRL, and the Institute of Marine and Environmental Technology at the University of Maryland Center for Environmental Science. The mission of the COAST team is to enhance public understanding of the effects of the Deepwater Horizon 2010 oil spill and to build trust in the process of science by engaging a group of citizens to work with the researchers. Team members learn the biological processes that govern how and where spill and clean-up products make their way into the food chain as they learn the steps involved in conducting the research and work with researchers to complete some of those steps. The team is drawn from the oil-affected area along the Mississippi Gulf Coast and includes commercial and recreational fishers, community volunteers, staff members from state and federal agencies, college students, master naturalists, and teachers. There are also two GCRL “Advisors, the website developer and the head librarian. This is the first example of an “embedded librarian” at GCRL.

Keywords: Community outreach, marine education EPA, crustaceans, oil spill, Deepwater Horizon, Mississippi.
PANEL: Embedded Librarianship

BARRACKS-BASED LIBRARY INSTRUCTION FOR FEMALE STEM MAJORS
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Abstract:
Four members of The Citadel’s campus-based Faculty Assessment and Analysis Team competed to participate in ACRL’s Assessment in Action (AiA) inaugural cohort, a 14-month learning community dedicated to proving the value of library services to student success. The Citadel team comprised of a librarian leader, the faculty chair of Chemistry, the faculty chair of Civil & Environmental Engineering, and a professor of Education, developed a project idea that takes library instruction to military barracks housing areas during mandatory Evening Study periods. The focus of the pilot study is to determine whether embedding a librarian in the cadets’ regimented habitat will improve degree persistence, academic achievement, and graduation rates for female STEM majors. While female cadets comprise just fewer than 6% of the Corps of Cadets, more than 51% of female cadets choose to major in STEM disciplines. This paper will present preliminary results from using this approach and explain the tools and resources used to align library assessment efforts to college-wide strategic initiatives and to measure and prove the value of library resources, services, and expertise to student learning.

Keywords: military schools, female cadets, STEM, embedded librarian.
PANEL: EMBEDDED LIBRARIANSHIP

EMBEDDED ONLINE LIBRARY SUPPORT IN ONLINE COURSES AT MARINE INSTITUTE

Catherine Lawton
Memorial University of Newfoundland
Marine Institute
Dr. C. R. Barrett Library
CANADA

Abstract:
The concept of Embedded Librarian is not a new one. It arose from a recognized need to support distance students. “Embeddedness” varies from one academic library to another, ranging from a simple “help” button on a distance instruction page to librarians actually involved in teaching and marking within the course. At the Marine Institute the concept of “Embedded Library Support” was introduced as a pilot project to give library support to the many new online courses being developed. The uniqueness of Embedded Library Support is that all library staff at Dr. C. R. Barrett Library at Marine Institute are involved in providing reference support. With this in mind, a “role” was created in the learning management system called “library support.” The librarian and staff take turns monitoring the online courses that are being supported. While this project is still in a pilot stage, faculty and student reception has been positive and the effect on staff workload has been positive.

Keywords: Embedded librarian, distance education, marine science.
YOU TOO CAN BE AN OCEAN TEACHER

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Abstract:
Three years ago IODE (part of IOC) began to develop a collection of instructional videos called OceanTeacher and, as of this writing, there are 425 items in this Vimeo-based resource (http://vimeo.com/iode). An MOU between the IAMSLIC and IOC has been signed, and IAMSLIC members have been appointed to a joint IAMSLIC-IODE Group of Experts on Marine Information Management (IAMSLIC/IODE GE-MIM). IAMSLIC members have also been encouraged to contribute their expertise to the OceanTeacher video collection. This paper describes the creation of the first collaborative IODE/IAMSLIC instructional video (and supporting instructional document) and chronicles how the resource was promoted and vetted by a GE-MIM member.

Keywords: IAMSLIC (International Association of Aquatic and Marine Science Libraries and Information Centers); OceanTeacher; Intergovernmental Oceanographic Commission (IOC); International Oceanographic Data and Information Exchange (IODE); Ocean Data and Information Network (ODIN); Group of Experts on Marine Information Management (GE-MIM); Screencast-O-Matic; Google Earth; GeoCommons.

A Primer on IODE and IAMSLIC
For those who may not know, the Intergovernmental Oceanographic Commission (IOC) has provided travel support to individuals associated with their Ocean Data and Information Network (ODIN) groups to allow them to attend and present at International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC) conferences. They routinely pay IAMSLIC membership dues for a significant number of ODIN participants as well. This provides ODIN members with both voting rights as well as access to the IAMSLIC Resource Sharing program and Z39.50 Distributed Library. A Memorandum of Understanding (MOU) between the IOC and IAMSLIC in 2011 (http://www.iamslic.org/wp-content/uploads/2010/07/IAMSLIC-MoU-IOC-2011.pdf) established the International Oceanographic Data and Information Exchange (IODE) of the IOC as the host of Aquatic Commons, IAMSLIC’s thematic digital repository (http://aquaticcommons.org/). A further proposal to create a joint IAMSLIC/IODE Group of Experts on Marine Information Management (IAMSLIC/IODE GE-MIM) was ratified in 2013 and committee members have been appointed (http://www.iamslic.org/wp-content/uploads/2010/07/proposal-joint-iamslic-iode-ge-mim.pdf)

How does this impact the average IAMSLIC member? You might assume that calls to participate in the joint IAMSLIC/IODE GE-MIM and OceanTeacher are geared towards individuals from larger libraries specializing in some facet of librarianship, not one-person librarians at remote branch libraries like me. Not so! Read this recommendation from the proposal mentioned above and you will see how each of us has the background to contribute to the OceanTeacher education resource:

Develop activities and information products to improve the capability of the marine information management community, particularly within developing countries, to benefit from and participate in marine information systems and keep the marine information management community informed on how they might best have access to such systems through the application of new technology.

Visualizing Data – The Background
My student assistant and I created a geo-referenced bibliography of the Coos Bay area (Oregon, USA). We used Google Earth to geo-reference citations and GeoCommons to display layers of information (Figure 1) (Butler & Schmitt 2012). I shared this project at the 2012 Cyamus meeting, and we also published our detailed process in *Issues in Science and Technology Librarianship* (ISTL) (Schmitt & Butler 2012).

![Figure 1.](image)

GE-MIM member Pauline Simpson read our ISTL article and emailed the following suggestion (P. Simpson, personal communication, February 17, 2012):
I made a recommendation to the recent GE-MIM Meeting that the methodology outlined in your paper should be the basis of a small online training module (perhaps the first joint IODE-IAMSLIC Training Module). The work might then also be the basis of a presentation for the IAMSLIC Florida meeting 'Visualizing our Bright Future'....

Visualization is one of the primary methods of presenting data and information - I do hope you will demonstrate and share this knowledge with the IAMSLIC and IODE community. Within IODE/MIM we see it as an important way of contributing to coastal marine atlases.

I needed some convincing. As a solo-librarian I am a jack-of-all trades but not an expert at anything. I was simply looking for a way to geo-reference a bibliography without needing to host a GIS (Geographic Information System) software. It turns out that was exactly what Pauline wanted, so I agreed to create an instructional video for the OceanTeacher collection with the following goals:

- Touch on geo-referencing in general, not just bibliographies
- Create an IODE-IAMSLIC training module
- Produce step-by-step instructions
- Show viewers a way to contribute to coastal atlases
- Empower others to geo-reference without having to host a GIS system

The idea of demonstrating such detailed processes via WebEx was daunting. There are a lot of steps, so I felt the audience would need to see the file manipulation in real time. The information on the computer screen would be more meaningful than an image of the speaker. After some discussion, IODE agreed I could create the video using screencast software.

Using a screencast software like Screencast-O-Matic, Camtasia, or Captivate provides a more professional-looking video, as well as an editing suite, than free software programs such as Jing. If you need advice on creating a screencast video there are a myriad of resource on the web. Ho, 2013 is particularly helpful and most offer the following advice:

- Create videos that are 2-minutes or less so they are quick to load and snappy
- Create an “itinerary” or storyboard
- Write a script
- Record the script and don’t try to do “live”
- Record the video and edit
- Include the ability to navigate (skip forward)
- Use a quality microphone (I purchased the Blue Yeti USB microphone--$100)
- Use a “producer” model rather than a “live demo”

We settled on Screencast-O-Matic (http://www.screencast-o-matic.com/), which is compatible with the Vimeo hosting system used by IODE. There is a free version of this software, but I opted to purchase the professional version because I knew I would need to be able to edit the
video. This is a very affordable subscription of $15.00 USD per year, and while I didn’t use all of these options the advantages of the professional version (listed on the website) are:

- No watermark when publishing
- Recording time limited only by local disk space
- Hosted in High Definition and supports playback on most mobile devices
- Publish to Google Drive, Vimeo, Box, and Dropbox
- Publish Screen Shots
- Editing tools
- Scripts tool
- Screen Shot tool
- Record system audio on Win Vista/7/8
- Webcam Only Recording
- Draw & Zoom while recording

There are a number steps involved in creating a geo-referenced bibliography: create a folder in Google Earth, export a KML file, convert to a CSV (comma separated value) spreadsheet, upload into GeoCommons, and geo-locate the data. The instructional video provides details on the overall process and documents each step, but I felt that a written document should be created to supplement the video. I documented all of the steps and posted this document to my institutional repository (http://hdl.handle.net/1794/12859). I also included all of the captions, URLs and citations used in the instructional video so viewers would need not take notes while watching.

I estimated the final video would end up being 35-40 minutes long. Personally, my interest in an instructional video can wane quite quickly. I opted to give viewers some tips for navigating through the video so they could jump to a section of interest, particularly if they chose to view a section of the video a second time. Some of the more expensive screen-cast software (e.g. FlixMaster) may allow you to hyperlink to anchors within the video, but this was not available with Screencast-O-Matic. The work-around in this case was to include a navigation screen (timeline) in the video and instructional document (Figure 2).

**Navigating through this video:**

- The presentation is divided into several sections so you can skip forward or repeat sections of interest. You could even pause and work along with the screencast to create your own geo-referenced bibliography.
- Overview of what we will cover (approximate time into the video):
  - Background: why geo-referenced bibliographies (1:52)
  - Software required (3:50)
  - Geo-locating citations with Google Earth (4:44)
  - Exporting data from Google Earth (18:38)
  - Importing data into GeoCommons (22:39)
  - Keeping your bibliography current—replacing an existing dataset layer (29:37)
  - Additional information and resources (32:49)

![Figure 2](image-url)

Unfortunately, many of the best-practices recommendations didn’t work for me. The 2-minute or less video was not an option for this video because of the complexity of the operations
involved. I initially created scripts (Figure 3). However, it was very hard to estimate how long each step in the process would take, so it was hard to match the script to the actions on the screen. Ultimately, I practiced the moves on the screen, practiced reading my script and then recorded the two simultaneously.

![Figure 3.](image)

I work in a one-person library so am interrupted quite frequently. I finally resorted to recording small sub-sets of the video and then piecing them all together. Anyone attempting to do this should plan on doing all the recordings at in the same room and ideally at the same time. Sound can be very different from one computer to the next. Also decide on a frame size and use that for recording all of your segments. File size was not an issue for this 35-minute video which ended up being less than 10 megabytes in size (files sizes of 300 to 400 mb per hour are allowable on Vimeo). I recorded at a slightly lower resolution and it looked fine on the screen during editing, but the resolution was not ideal in the final product. Based on that I would advise you to record in high definition if you are doing a similar project. Don’t underestimate the amount of time it takes to edit the video—post production takes as much time as recording the video. If you decide to contribute to the OceanTeacher collection you may want to review the guidelines from Vimeo, the site used to host this collection:

- Video compression basics (http://vimeo.com/videoschool/lesson/259/video-compression-basics)
- Video compression guidelines (http://vimeo.com/help/compression)
- Vimeo Video School (http://vimeo.com/videoschool)
- Help Center (http://vimeo.com/help)
- Vimeo FAQ (http://vimeo.com/help/faq)
HELP FROM GE-MIM:
Pauline reviewed my video, read my instructional handout and created her own geo-referenced resource in GeoCommons, the “Lionfish in Cayman Bibliography” (http://geocommons.com/maps/290926). She asked me questions along the way and suggested where the instructional handout needed more step-by-step detail. As a result, I have a much more thorough and usable handout. If you opt to add to the OceanTeacher collection know that the folks from the Joint GE-MIM will be there to help you with the process.

THE FINAL PRODUCT:
I made use of still shots and in some cases used PowerPoint to craft slides for the video. Those were interspersed with live action to create the final product. I kept things simple and used the same fade-to-color background transition between segments. There were many more editing options available to me, but I found I was able to craft the video with just some very basic edits. The opening screen (Figure 4) is branded with the IODE and IAMSILC logos. It also contains my picture so, hopefully, I don’t appear as a disembodied voice (http://vimeo.com/74282844).

Creating geo-referenced bibliographies using a combination of Google Earth and GeoCommons

![Image](http://geocommons.com/maps/290926)

Figure 4.

You Too Can Be an Ocean Teacher
Think of the presentations or lectures you have already polished for your own patrons. Maybe one of those could be added to OceanTeacher? In my case a screencast video was the right answer, but your contribution could be in the form of a WebEx or other recording. My institution expects that I contribute to the profession and this project allowed me to do that. It took me some time to learn the details of the screencast software, but that was time well spent. I will be using screencast videos to demonstrate a number of library processes to supplement my library instruction sessions. This was definitely a win-win situation and I’m proud to say that Pauline has already used my video as a training tool in the ODINAFRICA Marine Information
Management Workshop, 7-11 October 2013 in Mombasa, Kenya. If I can do it, so can you—please consider how you too can be an OceanTeacher.

References


INSTRUCTION

11,664 KILOMETERS ACROSS THE SEA:
BRIDGING THE STUDENT SUPPORT GAP TO THE PAFICIA ISLANDS

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Abstract:
The Library Education for the U.S.-Affiliated Pacific (LEAP) program was funded by an Institute of Museum and Library Services (IMLS) grant to provide the opportunity to pursue a master’s degree level, distance education program in library and information sciences for the U.S.-affiliated Pacific Islands (USAPI). The USAPI consists of six distinct political entities, including the Territories of American Samoa and Guam; the Commonwealth of the Northern Mariana Islands (CNMI); the Republic of Palau; the Republic of the Marshall Islands (RMI); and the Federated States of Micronesia (FSM). What differentiated this program from other University of North Texas (UNT) distance programs was the inclusion of mentors assigned to each student and a much larger role for the embedded librarians in the introductory workshop and throughout the two-year degree program. Library skills were integrated into the curriculum of the 10-day, on-site, total immersion program. This would be the only face-to-face contact students would have with faculty or librarians. We will discuss the numerous reference channels used, the librarian-in-the-classroom program, and the effects of culture on communication. Issues with long-term sustainability of mentoring relationships and access to resources will be also discussed.

Keywords: Distance learning, embedded librarian, Micronesia, MLIS, mentoring, multicultural students, online courses, library education, multiculturalism.

Introduction
For several decades Jane Barnwell, Director of Library and Literacy Initiatives at Pacific Resources for Education and Learning (PREL) had been concerned that there were no indigenous
librarians in the U.S.-affiliated Pacific Islands with degrees from an American Library Association (ALA) accredited program. Through her conversations with Beth Avery and Institute of Museum and Library Services (IMLS) program officers, three partners were brought together to apply for an IMLS Laura Bush 21st Century Librarian Program grant to bring the University of North Texas (UNT) online master’s degree program to the area. These students would remain on their home islands and, upon successful completion of the program, work to bring 21st century information services and skills to the region. These librarians would be challenged to provide leadership by mentoring and encouraging other persons interested in entering librarianship.

For a variety of reasons, most notably the lack of local accredited graduate library and information science programs and inadequate funding, there are few qualified librarians in the U.S.-affiliated Pacific region. For example, in the Federated States of Micronesia (FSM) Mr. Dakio Syn was the only indigenous librarian to have successfully completed a master’s degree in librarianship; he passed away in 1997. Except for Hawaii and in some cases such as Guam and the Commonwealth of the Northern Mariana Islands (CNMI), the person placed in the role of librarian often has little or no formal education in the discipline. No regional programs of higher education in librarianship currently exist to provide the advanced degree necessary to prepare professional librarians to serve their communities. The Palau Community College (PCC) established an associate’s degree program in library science in 2007, thus making some formal training available to residents of this remote island (IMLS Application Narrative 2009).

The UNT College of Information, Department of Library and Information Sciences (DLIS) has a history of developing successful distance cohorts of students based on the blended learning approach. The UNT online program is able to meet the needs of students in remote areas around the world. The master’s degree in library and information sciences (MLIS) program had been successfully sustained and expanded in Texas and other states, including Georgia, California, Nevada, Utah, and Virginia.

The Library Education for the U.S.-affiliated Pacific (LEAP): A Project to Strengthen Libraries and Library Education in the U.S.-Affiliated Pacific Islands program was developed specifically to support indigenous students from the geographically dispersed and economically depressed areas of the U.S.-affiliated Pacific Islands in a master’s program in librarianship utilizing distance learning and culturally relevant support services. The UNT DLIS and University Libraries, in collaboration with formal partner Pacific Resources for Education and Learning (PREL), successfully collaborated for three years. The goal of the proposal was to support the cohort in meeting their educational goals within the three years of this project. In Year One project partners planned to implement, and deliver the program to the Pacific, representatives from all three partners jointly developed the recruitment strategy, professional development programming, website design, and project implementation. In Year Two students attended an opening “Web Institute” in Guam, decided on a program of study, started classes, and attended a professional conference and workshop. In Year Three classes continued, students made presentations at the Pacific Educational Conference, and graduated.
The Challenges
The Pacific region served by PREL includes ten U.S.-affiliated island entities with the political statuses of a state, commonwealth, territory, or independent nation in a compact of free association with the United States. These entities include the state of Hawaii; the Territory of American Samoa; the Territory of Guam; the CNMI; the FSM, including the states of Chuuk, Kosrae, Pohnpei, and Yap; RMI; and the Republic of Palau. The entities are spread across more than 4.9 million square miles of ocean and hundreds of islands and atolls, many of which are uninhabited. The LEAP Project’s UNT faculty members live and work primarily in the central time zone of the United States. Clearly the first challenge was providing communication and education across six time zones, the International Date Line, and the equator.

The second challenge was presented by the limited incomes in the area. A disproportionate percentage of the population is undereducated; a large number are English-as-a-second language learners; and the cost of education is high. There is considerable income variation across the region. For example, the average per capita income in the state of Hawaii is $27,814 (U.S. Dept. of Commerce, 2008); while in the RMI it is $3,070 (World Bank, 2008). Approximately 250,000 students are enrolled in public elementary and secondary schools in the Pacific region, primarily in schools classified as rural (PREL, 2007) As in the rest of the United States, English language learners often have difficulty achieving in school. Various National Assessment of Educational Progress (NAEP) studies of math and reading continue to document poor performance of students from Hawaii, American Samoa, CNMI, and Guam (NCES, 2005). While NAEP does not report achievement for the FSM, RMI, or Palau, Pacific educators and researchers agree that student performance is well below standard in the rest of the region, while attrition levels are very high. Young and rapidly growing populations are common, placing enormous challenges upon the social and educational systems and fragile economies.

The Pacific region is multi-cultural and multi-lingual. Among the region’s 1.6 million people, nine different Pacific cultures are prominent. More than 30 languages are in use in the U.S.-affiliated Pacific (PREL, 1995). This presented the third challenge. Considerations of the cultural context of education and inclusion of mentors from these contexts would be critical elements to an understanding of successful program design and implementation.

The IMLS Grant
The IMLS grant awarded UNT $999,700.00 for the program. The costs of recruiting, scholarships and student materials, program support, enrichment activities, and travel were included in the grant. To be admitted to the program, all students must have completed an earned BA/BS degree from an accredited college or university recognized by UNT prior to starting the program, and must be accepted to the MLIS distance program using the same criteria as all UNT students.

When developing the grant proposal we identified several critical areas that needed to be funded. Distance programs require good Internet connectivity and up-to-date computers. High speed Internet connectivity can be expensive in remote areas and, given the average income in the area, beyond the ability of most students to pay.
Full tuition scholarships were awarded to twenty-three students, called the LEAP Scholars. In addition to all tuition and fees, the scholarships included the additional support needed to complete the program such as a laptop computer and the cost of connectivity, professional association memberships in the Pacific Islands Association of Libraries, Archives, and Museums (PIALA) and the joint ALA/Hawaii Library Association, and travel to the Web Institute held on Guam and to the PIALA and Pacific Educational Conferences (PEC) in Saipan.

Scholarship requirements stipulated that students had to agree to attend and present at the PEC and/or PIALA conference in Saipan, CNMI, which was also where the graduation ceremony took place. Scholarship recipients also had to agree to work in a local library or information center in the USAPI for a minimum of 2 years after their degree completion.

**Recruiting**

The LEAP project recruitment plan sought to identify potential students and to inform employers about the program immediately after the grant award. The plan identified a variety of methods to market the master’s degree program and the LEAP scholarship program to the Pacific community. A goal of the LEAP project was the enhancement of library education opportunities for the indigenous populations of the Pacific island region. To that end a major focus of the recruitment plan was to identify, recruit, and admit indigenous students who are representative of the demographic, cultural, and linguistic diversity of the region. Jane Barnwell has lived and worked in the USAPI for over 25 years, and her extensive knowledge of the region, and in particular her relationships with individual librarians, formed the basis of the recruitment effort, as many eligible individuals had already been recruited to apply for the program upon its successful funding.

Methods to achieve the recruitment goals included the following: publication of press releases about the LEAP scholarship and the UNT/DLIS program by the UNT and PREL; recruitment information sessions, developed and scheduled immediately after the announcement of the grant award and held in the USAPI; and virtual information sessions conducted using Wimba Classroom online technology. An article by Jane Barnwell about the grant was published in the *Pacific Educator*. Information sessions were publicized in the Pacific Daily News and in the Saipan Tribune in Guam and Saipan.

Production of promotional materials included a four-page color brochure to market the IMLS/UNT LEAP Scholarship and the UNT/DLIS program. The brochure included instructions for applying for the LEAP scholarship as well as extensive step by step directions for the admission process to the Toulouse Graduate School and the DLIS, MLIS program.

Exhibit booths and information sessions were staffed at professional conferences by Dr. Yvonne Chandler, UNT/DLIS faculty member and principle investigator, and Jane Barnwell, who attended the 20th Annual Conference of PIALA held in Chuuk State, FSM in November, 2010. The PIALA conference was attended by librarians and administrators representing all of the islands in the USAPI. Dr. Chandler gave a conference presentation about the LEAP grant and the scholarship program.
Promotional materials, brochures, and application materials were distributed to libraries and universities in the USAPI. Creation of a mailing list included contact information for paraprofessionals or library assistants working in libraries; professional librarians; and library directors of public school systems, colleges and universities, public libraries, and special libraries on the six Pacific Island entities.

In person and virtual information sessions were presented by Dr. Yvonne Chandler and Jane Barnwell on the islands of Pohnpei and Chuuk; FSM Micronesia at the College of Micronesia; Guam at the University of Guam, various Guam Public Library branches, Guam Public Schools and the Guam Department of Education Service Center; and on CMNI at the Northern Marianas College and the CNMI Public School System. Jane Barnwell facilitated virtual information sessions on the islands of American Samoa and Palau. Dr. Chandler participated in those sessions via Skype; she also traveled a total of 38,336 air miles to recruit the students for the LEAP program.

Advertisements were placed in print and online journals and newsletters and posted on listservs promoting librarianship as a career and the LEAP scholarship program. A dedicated website promoting the IMLS/UNT-DLIS LEAP Scholarship program and the MLS educational program was created, providing links to program information, the LEAP Scholarship application forms, instructions, and other information about the project. The site may be viewed at http://lis.unt.edu/apps/leap.

Through these varied recruitment efforts, contact was made with 232 individuals who showed interest, emailed, or attended a virtual or in-person information session. The majority of attendees at information sessions were female; they also included a cross-section of the represented demographic populations of the Pacific Islands, and lived equally in both rural and urban areas. Approximately one-third of the students who ultimately applied and were accepted into the program were selected to receive the LEAP scholarship. The most frequent method that the interested students heard about the LEAP master’s degree program and scholarship was by attending an information session or directly from a library or information professional.

The committee evaluating scholarship applications included three island college library directors; one public library director; two instructors in local undergraduate library science programs; Dr. Yvonne Chandler, UNT Faculty; Jane Barnwell, PREL; and Beth Avery, UNT Librarian. The applications were evaluated on six criteria:
   1. Potential for academic and professional employment success (resume);
   2. Community involvement (examples of community service);
   3. Successful employment and indication of future employment success (work history, purpose, and goals);
   4. Understanding of Pacific region library issues and needs (library services essay);
   5. Communication skills – written (entire application);
   6. Recommendations (letters of support).
The LEAP project team successfully recruited 23 students to receive funding. Seven other students were recruited who paid their own tuition for the first five semesters, but they did receive IMLS funded scholarships to pay their tuition for the last term.

**Demographics**
PREL evaluation staff was responsible for the ongoing program evaluation and related IMLS reporting requirements. To provide baseline data and to begin the evaluation and assessment program for the grant, each grant recipient completed an intake survey that included demographic information. The gender makeup of the LEAP Scholars was 60.9% female and 39.1% male. Each of the USAPI entities except the Marshall Islands was represented by a scholarship recipient. Since Guam is the most populous island in the Pacific area, the largest ethnicity in the cohort was Chamorro, which is the indigenous population of Guam and the CNMI.

<table>
<thead>
<tr>
<th>LEAP Scholars Live In</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Samoa</td>
<td>13.0%</td>
<td>3</td>
</tr>
<tr>
<td>Guam</td>
<td>43.5%</td>
<td>10</td>
</tr>
<tr>
<td>Commonwealth of the Northern Mariana Islands (CNMI)</td>
<td>21.7%</td>
<td>5</td>
</tr>
<tr>
<td>Federated States of Micronesia (FSM)</td>
<td>17.4%</td>
<td>4</td>
</tr>
<tr>
<td>Republic of the Marshall Islands (RMI);</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Republic of Palau</td>
<td>4.4%</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Table 1. Home countries of LEAP scholars.*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Percentage</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamorro</td>
<td>26.1%</td>
<td>6</td>
</tr>
<tr>
<td>Micronesian</td>
<td>13.0%</td>
<td>3</td>
</tr>
<tr>
<td>Samoan</td>
<td>13.0%</td>
<td>3</td>
</tr>
<tr>
<td>Other (Hispanic, Korean)</td>
<td>13.0%</td>
<td>3</td>
</tr>
<tr>
<td>Chamorro - Pacific</td>
<td>8.7%</td>
<td>2</td>
</tr>
<tr>
<td>Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filipino</td>
<td>8.7%</td>
<td>2</td>
</tr>
<tr>
<td>Chamorro - Caucasian</td>
<td>4.3%</td>
<td>1</td>
</tr>
<tr>
<td>Chinese</td>
<td>4.3%</td>
<td>1</td>
</tr>
<tr>
<td>Palauan</td>
<td>4.3%</td>
<td>1</td>
</tr>
<tr>
<td>Did not Answer</td>
<td>4.3%</td>
<td>1</td>
</tr>
</tbody>
</table>

*Table 2. Ethnicity of LEAP scholars.*
The Web Institute: Developing Relationships – August 2011 in Guam

“The University of North Texas Department of Library and Information Sciences created the Web Institute as a foundation for distance learning students to begin their Master’s degree study. Students meet at the host site for two-to four-day institutes where all of the core courses are introduced. The students complete the remainder of the courses for the master’s degree online. The Institute consists of classroom instruction, technology training, and social events. The Department of Library and Information Sciences faculty believes that these three elements provide the best opportunity for individual success in a distance education program. The Web Institute courses are open to all students pursuing the Master’s degree through Department of Library and Information Sciences.” From the DLIS website, [http://lis.unt.edu/web-institute](http://lis.unt.edu/web-institute)

The LEAP Cohort was unique in many ways. It was the first international cohort; students met each other and the UNT faculty members and librarians for the first time at the Outrigger Guam Resort in Tumon, Guam. The ten days were filled with intense daily instruction and social activities, which took place from 8:00 a.m. until 5:00 p.m., and 7:00 – 9:00 p.m. The students and faculty had the opportunity to get to know each other. Study groups and other support networks were formed as a result of this time together.

In other UNT Web Institutes in the contiguous United States, the schedule is for two to four days and the teaching team consists of a faculty member and a teaching assistant. Bibliographic instruction in those situations is a one hour presentation presented online by Cindy Batman, the Liaison to the DLIS. When students travel to UNT in Denton, Texas, for a Web Institute, they receive one hour of face-to-face library instruction while on campus. The students in the Web Institute in Guam received twenty-three hours of information literacy instruction, which was an integral part of the classes and curriculum taught to the students.

The Web Institute in Guam was led by the UNT teaching and advising team comprised of Dr. Yvonne Chandler, Dr. Linda Schamber, Dr. Larry Enoch, Beth Avery, Cindy Batman, and Charlotte Thomas, along with Jane Barnwell, from PREL. Students represented diverse backgrounds and included ten different cultures. Some had previously earned master’s degrees; some had never taken an online course; one had never been on an escalator; and most were the first in their family to earn an advanced degree. Nine additional cohort students not selected for scholarships joined the Web Institute and paid their own way for all program costs, including tuition materials, travel costs, etc. The two lead librarians, Avery and Batman, were embedded throughout the Web Institute, in the classes with the students as well as throughout their ten days in Guam. Librarians were always present and provided continuity for the students. They assisted when other faculty members were teaching and helped manage group work.

**Web Institute activities**
The activities held at the Institute began with an orientation session for all of the LEAP students. This session was held on the first afternoon after the scholars arrived on Guam. Full admission to the UNT program requires entrance examination scores from each student from a standardized test such as the Graduate Record Examination (GRE). Because many of the
students live on islands with no entrance examination testing center, arrangements were made for all of the students to take the Graduate Record Examination at the Guam Prometric Testing Center. At the orientation session the project team reviewed information about the program, including funding and expectations. Each scholar received a software loaded laptop computer and was instructed in loading the Wimba software recommended for the Blackboard Course Management system needed for the online classes.

The cohort-based approach to the UNT/LIS program provides an opportunity for students and faculty to build a vibrant learning community. Students participated in an array of enrichment activities and coursework geared toward cultivating library leaders in the 21st Century at the Web Institute. The Institute began with the traditional Web Institute Welcome Dinner at the Fiesta Resort Guam in the World Café. The Dutch treat meal was accented with a gift of mwar mwar (traditional floral headpieces) given to the new students as from their librarian mentors. The dinner gave students the opportunity to meet informally (but nevertheless extensively) with the Institute faculty and support staff and fellow cohort members. Individual advising sessions were held with the students to plan their curricula for the two-year program.

The design of the LEAP Web Institute allowed for the students to truly build a community as there was more time for social events and other activities to be held with the cohort. During the Institute, a varied set of on-site enrichment experiences were offered, including a professional development workshop led by Jane Barnwell and Guam librarians, a cultural evening led by the students, and library tours. The students toured the University of Guam – Robert F. Kennedy Library, the Richard Flores Taitano Micronesian Area Research Center, and the Guam Public Library. After the tours, the entire cohort celebrated reaching the midpoint of the Web Institute with the “Halfway Lunch” at the famous Shirley’s Coffee Shop.

The students took over the presenting at the Web Institute with the program “Pacific Voices.” Students from each of the islands gave fascinating presentations about the culture, traditions, history, and fun facts about their island. Group presentations were lively and included stories of island traditions of courtship, costumes, food preferences, and religious beliefs unique to their island. The personalized presentations allowed everyone to learn more about the islands and more importantly, each of the students. The presentations were videotaped.

The first of the professional development workshops designed to meet the goals of the project plan was held at the Web Institute. This career development workshop proved to be very popular and useful. The workshop consisted of a panel of local library professionals who shared their experiences, career stories, and ideas for success in the information world and librarianship. Each panelist addressed a series of questions posed by program participants. Questions included: What is a professional job really like? What are the ins and outs of day-to-day work as a librarian, technologist, or vendor? What is being a librarian or information specialist really like? What else can one do with a MLIS degree? What is the future of librarianship?
**Students’ impressions**

Student’s impressions of the Web Institute were “exciting, draining, really good.” Students were awed by the opportunity, overwhelmed at the challenge, terrified of the technological difficulties that could hamper their success, and dumbstruck at the amount of reading and research paper writing required. They began to see that librarianship is a complex profession.

Overall the students saw it as a very positive, energizing experience conducive to being successful in the program. They began to understand that a large commitment of time was needed that would require the support of others. The most important thing seemed to be meeting and connecting with the other students. The group bonded during the Institute, relationships were formed, study-buddy systems developed. A large study group was organized among the Guam students. Accountability partners helped each other on the smaller islands.

**Classes: During the Institute and the Next Five Semesters**

The three core classes of the UNT DLIS master’s program were launched at the Web Institute on Guam, essentially kicking off the cohort’s Fall 2011 semester. All of the Pacific Island students, whether scholarship recipients or self-paying, were in these class sections together as a unique section. The three faculty members, who had been with them throughout the Institute, taught the first three classes.

During the second semester, Spring 2012, one of their classes was still with their cohort group. However, due to the differences in their degree plans, these students were integrated with the rest of the Library & Information Sciences online students from their 4th class on. This experience allowed them to learn from other students from all over the world who were pursuing the same specialty, such as school librarianship or information systems.

**More Challenges**

The faculty members teaching the 4th through 12th classes in the LIS program were aware of the LEAP students as part of the MLS program and of the special arrangements that may need to be made in order to insure their success. However, in many cases they were unprepared for some of the curriculum, technological, and other needs of the Pacific Island students. Problems included the issue of time zones variations which made chat meetings difficult to schedule; the LEAP students did not have access to many of the literature resources need for some classes; and LEAP cohort students did not have the same opportunities to access physical libraries, study collections, use reference books, volunteer, or observe professional librarians. Weather related issues also impacted Internet access for some students.

Special challenges had to be addressed throughout the program. One cohort member was even farther away than the rest, teaching on a military base in Tokyo. Many time zones were involved in reaching students across the Pacific Islands; there is fifteen hours’ difference from UNT’s main campus in Denton, Texas, to Guam. This necessitated the Texas faculty team members sometimes teaching at 3:00 a.m. or 4:00 a.m. Class chats that required participation were held late at night, Central Standard Time. Two faculty members for the important core courses
conducted chat sessions from 3:00 a.m. to 5:00 a.m. Central Standard Time so that the LEAP students could attend class after their normal work hours.

With the exception of Guam, there were no certified school librarians on the Islands to provide school librarian mentoring, a requirement of the school library degree tract. Extensive work by several individuals was required to locate and train virtual mentors from the continental United States. In addition, librarians working in academic environments served as mentors to some of the students.

Once the program began, other challenges became apparent. One student had to leave work and go to the local PREL Service Center in the middle of her workday to participate in required class chats. One moved to another island for the duration of the program, because she did not have stable Internet access on her home island. There were long postal delays in receiving materials by mail, power outages that lasted for days, typhoons, and threats of missile attacks from North Korea that disrupted the cohort’s educational progress.

Communication and cultural issues proved most challenging of all. We all have cultural influences that we bring to our relationships and workplaces. These differences can hinder us when working cross-culturally. Learning about those differences and how to accommodate them in the classroom was important to the success of the LEAP students. The Pacific entities are challenged not only by political and economic diversity but also by cultural and linguistic differences; at least nine different Pacific cultures are prominent in the region. English may be a second, third, or even fourth language for the students.

These students had different priorities than the average U.S. student. The Micronesian cultures are very family-oriented (Ratliffe, 2010); many could not leave their homes or families for the two-year block needed to obtain the MLIS. For students from the Pacific Islands, their immediate families are their first priority, followed by extended family, community obligations, religion, culture, jobs, which all come before school work (Heine 2002). Students who spend two hours in dance practice after working all day may not have enough time to do homework. One of the students left the program after the first semester because she was unable to meet the family obligations that are traditionally handled by the unmarried daughter.

Customs related to terminal illness, death, and burial rituals plague faculty and students in every culture. There are many jokes in the U.S. about the number of grandparents who die when a major assignment is due, or at exam time. Jokes aside, even when it does happen most U.S. students are not involved in two weeks of rosaries and funerals that last six weeks.

The Western “me” versus islander “we” orientation was evident in classes as islanders work well together in groups and are not inherently as competitive as North American students. Most of the Pacific islanders tend not to be highly competitive, which we knew some faculty might see as “not trying hard enough.” If several students resided on the same island, they naturally formed study groups to support one another. Not all of the students were able to do this; in four
entities, the LEAP cohort member did not have fellow students on the same island, exacerbating the communication and support network challenges.

Pacific islanders have a strong desire to please. They will often try to answer the question with what you want to hear. So when asked if they were working on a project they would reply yes, when in reality they hadn’t started yet and may have had no intention of starting it for a few weeks. However, since they know you want the answer to be yes, that is the answer you get.

In Pacific cultures, communication styles reflect a tendency to defer to others, especially those in authority, elders, and males. Saving face is another very important factor. Indirect communication where people talk around a topic and try not to offend is generally favored over direct communication where people say exactly what they mean, and they see silence as an uncomfortable moment that needs to be filled with conversation.

While the confusion caused by communicating across six times zones caused some time problems, the vastly different views of time caused even more. Islanders tend to work on a cyclical clock where time is unlimited, deadlines are flexible, and tomorrow doesn’t necessarily mean tomorrow just not today. U.S. faculty operate on a linear clock in which schedules are determined and deadlines are firm (Culture Crossing, 2013).

**Workshops**
The workshops to enhance the students’ experiences and knowledge of the profession also distinguished this cohort from other UNT distance cohorts. The first of the professional development workshops designed to meet the goals of the project plan was held at the Web Institute. The second workshop was held in March 2012 and covered the topic of “Importance of Advocacy and Leadership in the Library Profession.” The panel of speakers was led by Dr. Herman L. Totten, UNT Vice President for University and Community Affairs and Dean of the College of Information, who flew to Guam for the workshop and spoke on the “Importance of Cultural Diversity.” The event was co-sponsored by the Guam Library Association, the Guam Department of Education, and the University of Guam Robert F. Kennedy Library. Dr. Yvonne Chandler spoke on “Advocacy and Communication – Promoting Your Library and Librarianship.” All of the LEAP scholars living on Guam attended the workshop. Wimba Live technology was used to deliver the workshop to the remaining scholars on the other islands. During the visit to Guam for the workshop, the LEAP scholars hosted Dean Totten with visits to their libraries, a tour of the island, and its historic locations, and a dinner.

Throughout the program, Jane Barnwell met with both individual students and groups of students to conduct informal and formal workshops, offer professional mentoring and support. In some cases she hand carried textbook orders and other program materials to the students. Ms. Barnwell also conducted focus groups to complement other methods of program evaluation. Her program of work at PREL includes a number of library development, training, and outreach activities that require her to conduct work on site throughout the islands. This was
advantageous to the LEAP program as we were able to leverage funds to minimize costs to the program for this important face-to-face work with the LEAP students.

**Mentors**
Students who received LEAP Scholarships were paired with UNT Librarians who served as mentors for the duration of the two-year degree program. The librarian mentor concept was developed due to the extreme distance and time zone differences of this cohort, Internet accessibility challenges, cultural uniqueness of the student group, and the lack of access to standard UNT support services.

Many of the UNT librarian mentors were also graduates of the UNT/DLIS master’s degree program, so they were able to give advice and tips on assignments and classes. This focused assistance was unprecedented and went beyond the normal reference and instruction interaction.

Throughout the program, the librarian mentors received training during several face-to-face meetings held by the lead mentors, Beth Avery and Cindy Batman. Jane Barnwell, PREL, visited UNT to meet the librarian mentors, talk about the challenges of technology on the islands, and discuss cultural and communication norms that would be challenging for the librarian mentors. Barnwell started them thinking about how they could help the students adjust to the different expectations the faculty would have, and how to help the faculty understand how to work effectively with this group of students. Throughout the two years, regular meetings were held to discuss challenges in particular courses, students in jeopardy, and the effectiveness of the mentoring taking place.

We thought that the mentors would be more approachable if they were perceived as not just librarian role models, but also as persons with interests similar to those of the students. We developed questionnaires for students and mentors that asked about education, jobs, and personal interests such as hobbies, reading preferences, and favorite kinds of music. The survey enabled respondents to share interests they considered important for someone else to know about themselves. The matching of librarian mentors and students was done through analysis of this information. In spite of the many differences there were similarities in areas such as undergraduate majors, previous jobs, hobbies and interests in cooking, comics, or sports.

The anticipated benefits of the mentor program were that each student would have one person at UNT who remained a constant source of support throughout the program. The mentor would help them with using library resources, understanding UNT culture, knowing what was expected in their courses, and directing them to UNT resources they might need for extra help. The mentors were expected to maintain regular contact with their mentees to discuss issues, answer questions promptly, and attend regular meetings of the mentor group to exchange ideas on working with the students and to work on solutions to common problems. Communication with students began before their classes started and lasted through degree completion in August.
2013, and continued to the final submission of conference presentation articles to the UNT Scholarly Works Repository.

At the Web Institute, Avery and Batman introduced the librarian mentor concept, showed pictures and introduced the librarian mentors. Students were encouraged to get to know their mentors, contact them for help with reference questions, access problems, search strategies, and research design.

On their return from the Web Institute, Avery and Batman virtually introduced the LEAP students to the librarian mentor teams. They showed pictures of all the students, discussed their personalities, reactions to the courses, any special issues that might be anticipated, and suggested common topics of concern. The mentor librarians were coached to communicate with their two students frequently, especially during the first semester. They wrote to introduce themselves to the students, told a little about their personal and professional lives, and tried to find common ground.

Multiple avenues were provided for communication between students and librarian mentors. The primary contact with students was by email, but mailings and phone calls were also utilized. Avery and Batman, the lead mentors, communicated with mentors as a group in the LEAP Blackboard course, Wimba Chats, or through Outlook in the library office. Batman, as the LIS liaison, could communicate with the LEAP students in individual LIS classes depending on the question, assignment, and time of the semester. One of the surprises of the program was that the hotspot for reference questions turned out to be Facebook! In addition to just saying hello how are you, frequent reference discussions occurred via Facebook chat.

The principal investigator and LEAP Project Research Assistant managed a Facebook page for LEAP Cohort students, faculty, and staff. The page is still accessible and being used to exchange photos, communicate news about their professional jobs, personal lives, and to catch up with friends developed over the two year cohort program. The URL for the LEAP Facebook page is https://www.facebook.com/pages/LEAP-Library-Education-for-the-US-Affiliated-Pacific/157270980990175

Some students asked their mentors for course advice, how to work with specific faculty members, help with problems with assignments, and assistance getting textbooks. Librarian mentors were heavily involved in the final deliverable of the program. Students were required to make a presentation at the PEC/PIALA conference where their graduation ceremony would take place. Students chose topics and subsequent stages of the presentation were sent to their mentors for approval: the topic sentence, abstract, PowerPoints, and the finished paper, which was then submitted to the UNT Scholarly Works Repository. Many of the librarian mentors were very supportive with this final project, assisting the students with the Institutional Review Board (IRB) live subjects approval process.
The mentoring program had its successes and its misses. Avery and Batman enjoyed close relationships with the students based on the foundation of the Web Institute’s ten days of enforced togetherness. Some of the students preferred to contact them instead of their assigned UNT librarian mentor because an in-person relationship had been formed. This is consistent and not at all unexpected given cultural norms.

For the most part the librarian mentors who had a virtual relationship only did not form strong ties. It was difficult for them to get responses from their mentees and the mentees sent them very few questions. Even resources developed specifically to help students received little response. The most productive area for communication was Blackboard Discussion areas and Wimba Live Classroom synchronous chats and archives.

In discussions with the mentors on why they thought the relationships did not develop as anticipated, the lack of actual face time was mentioned. This might have been lessened by the wider use of Skype or other face-to-face communication online methods. However, the time difference may still have been an issue, as some of the instant messaging (IM) chats on Facebook occurred when mentors were online at unusual hours at night, such as 2:00 – 4:00 a.m. Central Standard Time.

**Sustainability**

One of the persistent concerns of distance education courses is the challenge of creating sustainable educational communities in an online environment. The faculty team anticipated that relationship building with the librarian mentors would be strong and that students would want to maintain those connections after graduating. One detriment to life-long learning and professional development is that that few alumni will ever be able to match the depth and breadth of electronic resources available from the UNT Libraries.

Graduates often stay connected to their alma maters for the contacts with faculty members who will write reference letters to employers. Some career development presentations were done during the Web Institute by professional organizations in the Pacific islands. Students were encouraged throughout their course work to look for opportunities to volunteer, observe librarians, interview practicing librarians, join appropriate listservs and professional organizations, attend and present at professional conferences, and publish to enhance employability.

During the course of the two year program and immediately following degree completion, several LEAP students have taken on greater responsibility in their jobs, moved into paraprofessional jobs, or have been promoted to professional librarian positions, all quantifiable evidence of the immediate success of the program on the lives of these individuals, their families, and their communities. A number of LEAP scholars received promotions or were hired in new positions as a result of their graduate studies. LIS graduate Elvis Zodiacal was named as Director of the American Samoa Community College (ASCC) Learning Resource Center. Leap Scholar Jennifer Hainrick was named Director of the Learning Resource Center of the College of
Micronesia – FSM Library. Eric San Nicolas was promoted to Principal of Tinian Jr./Sr. High School. Ronald San Nicolas was elected as Vice President of the Guam Science Foundation.

Natalie Hill was appointed as the English Language Learner Instructor in Saipan. Maria Ornes is serving as Librarian at Saipan’s Kagman High School, and Debra Duenas has been appointed to the Guam Public Library Board of Directors. Justin Maga was hired as Cataloger for the Feleti Barstow Public Library in American Samoa, and the Palau Ministry of Education has created a new position of Specialist, Library and Computer Labs for Imengel Mad.

**LEAP Program Impact**

Since they would be unable to travel to Denton for the official UNT August Graduation Ceremony, the LEAP cohort had their closing experience in Saipan, Commonwealth of the Northern Mariana Islands during the week of July 13–20, 2013. The graduation was planned as part of the scholars’ participation in two consecutive professional conferences – the Pacific Islands Association of Libraries, Archives, and Museums and the Pacific Educational Conference.

The Graduation Program on July 19th was a celebration for the entire USAPI library community. Representatives from each of the islands and Pacific Resources for Education and Learning, including President and CEO Dr. Sharon Nelson-Barber, participated in the program. The address was delivered by Dr. Judith T. Won-Pat, Speaker of the 32nd Guam Legislature. She reminded the students:

“...although the technology is changing and we live in a global community, publications, information, indeed history, will always have to be organized, sorted, cataloged and distributed be it in digital form, or hard copy.

*Somehow, someway, knowledge must be preserved. And you all have learned the intricacies of this process.*”

An inspirational video message was delivered to the graduates by Mr. Daniel J. Peacock, former Director of Library Services for the Trust Territory of the Pacific Islands, on the value of maintaining cohesiveness of the group post-graduation.

As of the August 2013 graduation ceremony in Denton, 19 LEAP scholarship students completed all requirements for the Masters of Science degree in library or information science awarded by the Chancellor, President, and Dean of the College of Information of the University of North Texas. Two scholars will finish their studies by May 2014. When the remaining two students complete all requirements to earn their degrees, the Pacific region will gain 29 qualified librarians able to contribute to the development and improvement of libraries, educational programs and community activities.
After completion of their courses, eight scholarship and three self-paying students were initiated into Beta Phi Mu, the Library and Information Studies Honor Society. This organization recognizes and encourages scholastic achievement among library and information studies students. Eligibility for membership in Beta Phi Mu is by invitation of the faculty from an American Library Association accredited professional degree program.

Many students earned graduate academic certificates in addition to their MLIS. Four students earned graduate academic certificates in “Advanced Management in Libraries and Information Agencies,” seven students completed the certificate in “Digital Content Management,” and six earned certificates in “Youth Services in Libraries and Information Agencies.”

The goal of this project was to increase the number of graduate educated librarians with the skills and knowledge to implement high quality, innovative, useful, and credible educational and informational programs in the US affiliated Pacific region. The group will improve library and information services throughout the islands by their higher level of understanding of what librarians can provide.

**Visualizing a Bright Future**

What do our experiences with this class means to us, the librarians and researchers, who are working across cultures? First and foremost we need to be culturally aware of ourselves. Then it is imperative that we get to know one another’s cultural differences and become aware of the technical difficulties we might encounter before we embark on joint projects. We need to understand the cultural background we each bring to a project, be clear about our expectations, understand the technical difficulties in difference countries, to be aware of the realities of working together, and be willing to step outside our comfort zone to work in unfamiliar ways. Librarians can have a significant impact by working with faculty and researchers to develop cultural sensitivity and new teaching methods to enable this diverse community of future lifelong learners and cross continent research.

“We all have different paths to journey upon, but these paths lead to and cross one another.”

(Won-Pat speech)

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GIS AND DATA

Moderator: Michelle Leonard, University of Florida, Marston Science Library, Florida, USA

GIS DATA CITATION RATES: ARE DATA BEING PROPERLY CREDITED IN LISTS OF REFERENCES?

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Abstract:
Researchers in the field of Geographic Information Systems (GIS) use large data sets, many of which are combined with additional data sets to analyze and display information. Data relating to research is usually collected in the field and combined with layers of data from other sources. These sources are often credited within the text of an academic paper, but are not reported in the list of references. Citation of data is important in order to acknowledge and validate the source, and to create ease of access for other users. This study assesses the rates of GIS data citation in a sample of peer-reviewed academic journal articles from the years 2002 and 2012 to illuminate trends in citation patterns.

Keywords: Data citation, GIS, geographic information systems, geospatial data, spatial data, marine, aquatic.

GIS maps are built with layers of information that often come from other sources. These layers of information are citable, yet many are frequently absent from the list of references or the text of the article. It is important that this information is cited for multiple reasons: these data may have errors; others may wish to use these data; and authors deserve credit for their work. It also assists in the peer review process, allowing for information to be traced to its source and validated if needed.

Occasionally an article with a published map will have been created with only the authors’ data. Typically though, downloadable background layers are used (such as roads, rivers, and digital elevation models) in addition to the authors’ data. These layers are readily available from institutions such as the United States Geological Survey, universities, municipal governments, and ESRI, the makers of the most commonly used GIS program, ArcGIS. Many institutions, for
example the Harvard University Graduate School of Design, have created finding aids for spatial data in their collections (Cote n.d.).

A search of the Web of Science, Aquatic Sciences and Fisheries Abstracts, Academic Search Complete, Biosis, and Google Scholar on the following topics yields no relevant results to determine citation rates of GIS data, but does yield information relating to the importance of data citation and annotation: (“gis data” OR “geospatial data”) AND (citation* OR citing OR cite). For example, Mazzetti, Nativi, & Caron (2009) describe applications for geospatial data sharing for existing geospatial services and the need for the use of international interoperability standards for database backend structure for services, including data citation. As more GIS data are stored in repositories, there is a greater need to incorporate curation principles into systems to ensure accurate citation over time (Bose & McGarva, 2007).

A further search on the same topics in Google yields numerous research guides and citations of data sets for use in lists of references. The first 10 results yield six academic web pages, a government page, and three from commerce. The first three pages of results contain relevant sites aimed at citing GIS and geospatial data. George Mason University Libraries have a library guide for Geospatial Data & GIS Services with a page specifically for GIS Writing & Citing, linking to other resources that are freely available online. Although information on how to properly cite GIS data is readily available, sources are still rarely cited in lists of references. Many databases, like Web of Science, now supply lists of references that are attached to articles. If GIS data is not cited there, data creators are not receiving proper credit for their work. This is an issue with many types of data sets. If proper citation occurs, data creators have the “potential to become an accountable part of the scholarly communication process” (Mayernik 2012). A “Declaration of Data Citation Principles” is currently being drafted at The Future of Research Communications and e-Scholarship, FORCE11 site. Additionally, as data are accepted as citable elements of scholarly research, more papers will include data in the list of references.

In Web of Science, the search Topic = ((marine OR aquatic) and (GIS OR "geographic information system*")) yields 110 results from 2012 and the same search yields 41 results from 2002. These two sets of results were analyzed to determine if the citation trend is increasing or decreasing. The results were narrowed down to papers that actually use GIS data (determined by a printed map within the article) and further examined to determine if data were cited anywhere in the lists of references, inside the text of the paper, in the acknowledgments, or not at all. The materials and methods, acknowledgements, and reference sections of each paper were analyzed and specific keywords were searched. Those keywords were GIS, ArcMAP, “spatial data”, “geospatial data”, data, “Fig. 1” (or number corresponding with the map), bathymetry, and layer. The sample size started with 41 articles from each year, using a random number generator to for the 2012 articles, and was narrowed down to 26 articles from 2002 and 30 articles from 2012.

More than half of all articles examined had GIS data cited within the article as citations in the references, in the text, or in the acknowledgments. Fifty-eight percent of the articles from 2002
and 55% of the articles from 2012 had these citations. The citations were listed within the references in 23% of the 2002 articles and 20% of the 2012 articles. While these figures do not support an upward trend in citations, the sample size was not large.

This study should be replicated with a larger sample. For example, the same search could be conducted using Aquatic Sciences and Fisheries Abstracts instead of Web of Science because it is more specific to the field of marine GIS. Using the same search yields 117 peer reviewed articles from 2012 and 142 from 2002 in Aquatic Sciences and Fisheries Abstracts. Rather than using the same number of articles from both years, all articles should be examined and compared. The final sample sizes would be determined by the use of GIS after each article is examined. Additionally, articles that cite data within references can be examined to see if the publishers have an author requirement for the citation of data.

While a temporal trend in GIS data citations was not found, it is shown that almost half of the articles examined do not have data cited anywhere in the articles. This is problematic for the validation of authors’ results, and the acknowledgments of others work. Over time, this problem should decrease as data is considered a valued element of research, as can be demonstrated through the rise of data management plan requirements of grant-funding agencies.

References:
DEVELOPING AND IMPLEMENTING DATA SERVICES AT AN UNDERGRADUATE INSTITUTION

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Abstract:
California Polytechnic State University (Cal Poly) is a primarily undergraduate, comprehensive polytechnic university with roughly 19,000 students. The Cal Poly Data Services program currently provides basic support for faculty and students in data curation, data management, GIS, and scholarly communication. Whereas data service programs at most research universities focus on institutional data management, the program at this undergraduate institution is focused on developing a data literacy curriculum through instruction and peer-to-peer reference. The physical home for Data Services, the Data Studio, supports the virtual world of data literacy. The development and implementation of Cal Poly’s Data Services program and the lessons learned by its staff are discussed to help other undergraduate universities to begin or refine the development of library data services.

Keywords: Geographic information systems, electronic information resources – management, library outreach programs, data literacy.

Introduction and Background
California Polytechnic State University (Cal Poly), founded in 1901, is part of the 23-campus California State University System. It is an undergraduate and master’s granting university with approximately 19,000 students, 2,000 staff, and 1,300 faculty. The focus is on undergraduate education and it offers 64 bachelor’s majors, 68 minors, 31 master’s programs, and 14 credentials (California Polytechnic State University 2012). One direction to take when developing and implementing data services at an undergraduate institution is to move beyond institutional research data services and data curation toward a focus on data literacy. Using this lens and the “learn by doing” philosophy of the campus undergraduate curriculum helped Cal Poly refocus and define the role data play in the larger organization. The Data Services mission at Cal Poly’s Robert E. Kennedy Library is to support students and faculty in finding and using data for scholarship, teaching, and learning. This supports the larger Data Services vision to provide the resources and services to equip students with data literacy skills and collaborative opportunities to prepare them as 21st century citizens.
The Library is part of Information Services (IS), which also contains Information Technology Services (ITS) and the Center for Teaching, Learning and Technology (CTLT). Data is a common interest within this organization. ITS maintains servers, campus data backups, and supports Big Data needs. CTLT provides faculty support and instructional workshops. During the past few years the Library’s data services have evolved from solely providing basic GIS support toward a broader definition including data access, analysis, use, visualization, management, sharing and curation support, and the formalization of the Data Services Unit. In conjunction with Library and Campus ITS, Data Services is defining, employing, and maintaining the necessary hardware, software, and services for data discovery, access, use, dissemination, and storage within the Library, on campus, and in the community. This work contributes to the foundation for data literacy development.

The following is a discussion of what is being done, what needs to be known to move forward, and the challenges and opportunities at Cal Poly. The process can be relevant or applicable to other institutions at any stage of program evolution. Understanding the development and implementation of the Cal Poly program may help begin or improve other libraries’ data services programs.

**Scoping Data Services**

It is important to remember that the functions and activities of data services mirror those of broader library services. Collections, outreach, reference and instruction are part of managing journal articles, books, subscriptions, or data. Most of these general library functions are reflected in “data services” with a few additions like data management and scholarly communication. It is important to understand that rather than attempting to develop data services separately, Cal Poly instead incorporated them into the broader library services already in place. For traditional library services, reference, instruction, collections, etc., there are similar foundations that are translatable across disciplines. For example, finding an article for engineering is somewhat similar to finding an article in agriculture, and using the article is also similar in that it is read, ingested, and its content communicated. It is not quite the same in the data world; there is no “EBSCO for data.”

A challenge in scoping data services is to consider the overall size of the task. Data Services as envisioned is concerned with both front-end and backend services. This in itself is beyond the traditional realm of subject librarians, who may be involved on the backend with collections development and various planning and coordination activities etc., but who are not typically involved with administering technical infrastructure, software licensing, etc. There are both front-facing and backend Data Services at Cal Poly. Front-facing services include the Data Studio (computer lab/physical space), outreach, instruction, and reference. Backend services include data set storage, software and licensing, collections, and strategic planning. The Cal Poly student body consists of over 95% undergraduates. Figure 1 and Table 1 illustrate the proportion of students within the five colleges and the focus on front-facing services more than on backend. Cal Poly has been expanding front-facing services, but in order to effectively expand these front-
facing services it is necessary to expand the backend services in support, while recognizing domain-specific data areas and needs.

![Diagram of Breadth of Disciplines]

**Figure 1. Front-facing and backend service levels over a various subject areas.**

<table>
<thead>
<tr>
<th>College</th>
<th>Undergrad</th>
<th>Post Bac./Grad</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Food &amp; Env. Sciences</td>
<td>3,644</td>
<td>84</td>
<td>3,728</td>
<td>20%</td>
</tr>
<tr>
<td>Architecture &amp; Env. Design</td>
<td>1,453</td>
<td>80</td>
<td>1,533</td>
<td>8%</td>
</tr>
<tr>
<td>Business</td>
<td>2,297</td>
<td>37</td>
<td>2,334</td>
<td>12%</td>
</tr>
<tr>
<td>Engineering</td>
<td>5,007</td>
<td>404</td>
<td>5,411</td>
<td>29%</td>
</tr>
<tr>
<td>Liberal Arts</td>
<td>2,623</td>
<td>108</td>
<td>2,731</td>
<td>15%</td>
</tr>
<tr>
<td>Science &amp; Mathematics</td>
<td>2,575</td>
<td>273</td>
<td>2,848</td>
<td>15%</td>
</tr>
<tr>
<td>Others</td>
<td>81</td>
<td>13</td>
<td>94</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17,680</td>
<td>999</td>
<td>18,679</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Table 1. Number of undergraduates and graduates per college and as percentage of student body.*

On the front end, Data Services has been envisioned in line with the traditional library\subject specialist roles of reference and instruction, in addition to more involved programming and outreach (ex. The Data Studio Presents speaker and workshop series, Open House, Geography Awareness Week, GIS Day). The nature of reference in Data Services is also different; where traditional reference is primarily concerned with finding appropriate resources - which Data
Services serves - it also deals with working through technical challenges in utilizing available resources. Further, consultation on methodological development for students and faculty seeking to apply data to a particular project or question falls under the scope of Data Services. Finally, in contrast to the traditional model of subject librarians, Data Services staff are tasked with providing resources to support the entire breadth of disciplines on campus. The breadth of the subject specific needs is daunting at Cal Poly. Understanding the technical data-related needs, space, resources, and literacy components that would benefit the wide range of subject and discipline-related activities, and the wide range of existing student technical abilities are still questions the Data Services program needs to address.

It is critical to understand who Data Services’ patrons and stakeholders are, what their data needs are, how those needs vary by discipline, how services can be developed to meet those needs, and in light of this, how the scope of data services can be refined to provide the greatest benefit to patrons. This is part of a campus conversation on data and quantitative literacy at Cal Poly. Data Services within the library is not going to answer this question independently, but it is a logical and significant resource in supporting campus-wide data and quantitative literacy efforts.

There is a lot that libraries in general are seeking in the area of data services. Properly aligning expectations and actual service capabilities in this new area is not necessarily a given. By reviewing other data services programs, libraries can help scope their capabilities for service. Cal Poly reviewed more than 30 institutions. There are elements of different services that appear similar: data and GIS lab spaces, peer assistants, speaker series events, technical workshops, etc. Implementing Data Services at Cal Poly requires understanding resources to find and develop a model that works. What has been learned so far from reviewing the data services landscape is that the defined breadth and depth of data services at other institutions is wide. There are one to more than 70 staff serving various disciplines at different levels of service. An important take-away is that effective data service is a program, not a position.

Self-assessment is required before planning a program. At Cal Poly four staff members have some level of data curation, data management, and GIS skills sets. Cal Poly does not have an ARL library and cannot serve the campus community in the same way or at the same level of staffing as those institutions. A review of reference statistics revealed that 10% of all recorded reference questions have to do with GIS or data. This indicates a need for internal workshops, campus training, and continued Data Services staff trainings. Opportunities presented themselves when the Library was integrated into IS, while opportunities were sought through trainings geared to the Office of Research and Economic Development. The biggest obstacle at this time is lack of resources and unsustainable growth. Due to this Cal Poly chose to provide data literacy support to faculty, graduate, and undergraduate students in lieu of supporting institutional data curation and Big Data.
Program Development Highlights 2009-2013
Since the program’s inception in 2009, there have been a number of changes and highlights that show where the Data Services program is now. In 2009 a survey was deployed at Cal Poly, “A study of faculty data curation behaviors and attitudes at a teaching-centered university” and the results were published in College & Research Libraries (C&RL), July 2012 (Scaramozzino et al. 2012). In 2010 a data management LibGuide was developed (http://libguides.calpoly.edu/data) and basic training was offered to campus collaborators, including the Office of Research and Economic Development. In 2011 another survey of faculty was deployed, “A study of faculty data service needs at a teaching-centered university” (manuscript in progress), to determine a baseline for scientists' awareness and interest in library based infrastructure. In 2012 an area of the library was renovated and the Data Studio was created; a Data Services Working Group was convened resulting in the Data Services Program - First Year Program Report and the writing of Cal Poly's Digital Scholarship Program - A Proposal; and the first Annual Data Studio Open House was held.

The introduction to the campus of the Library's ideas about data services included having Peter Wiley Booth (the major Data Studio renovation donor), the President, Provost, and CIO cutting the ribbon to the Data Studio during the first Annual Open House. The event also included a showcase of student and faculty work. New York Times Technology Editor Quentin Hardy's plenary evolved into The Data Studio Presents, a lecture and workshop series on topics regarding GIS, data management, digital humanities, and more (see http://libguides.calpoly.edu/datastudio for additional information).

In 2013 a full-time Numeric and Spatial Data Specialist was hired and conducted an environmental scan of more than 30 institutions and universities with data services plus the other 22 CSU campuses. The scope of services and what can be accomplished by libraries can be informed by the examples available – there are individual spatial and numeric specialists providing basic access to social science data all the way to a 70 person campus-wide educational and research ITS groups. The Data Studio Presents events are now expanding to include STEAM (Science, Technology, Engineering, Art, Math) focused events. The Data Studio as place continues to be a space for students to experiment with technology and to collaborate.

Next Steps and Conclusion
Data Literacy Instruction
There are a lot of data out there, free and accessible to anyone, and there are general strategies for finding data. Students and faculty don’t “need” the library to gain access to these datasets in the same way as journals that are purchased through an institutional subscription or physical books are housed in the library. However, the data are not well organized, at least not to the same degree that library collections are organized. Data literacy instruction requires the ability to create information, use the information, analyze the data, share data, manage data, and collaborate with others regarding the data.
Many students are generally comfortable finding, reading, and ingesting information from a journal article but the same is not usually true for raw datasets. Students often have limited experience dealing with datasets they have created. This experience is not necessarily transferrable to finding other datasets and dealing with others’ data. Learning to find, view, manipulate, and perform analysis on datasets is a skillset like any other and takes time to develop. It takes practice, work, instruction, and curiosity. It takes multiple passes over the same ground. In short, it is a great deal more than “access” to enable students to work well with data.

Ideally the purpose of Data Services in the long term is to provide a platform for cultivating inquiry. Data literacy will be part of a larger “data sandbox” effort to help students communicate through writing, visualization, and more. The idea is that students should be met and helped whatever they are on the data literacy continuum. Are they learning to use a calculator, exploring Excel™, learning scripting, or creating web services? This will be accomplished in a comprehensive “Learning Lab” staffed in collaboration with the University Writing & Rhetoric Center, Statistics Department, and Graphics Communication Department and their peer assistants. The hope is that each student regardless of field will become an educated consumer, producer, and communicator of data, which requires learning to find and use data effectively. Cal Poly is currently defining the necessary skill sets needed for the data literate undergraduate student.

This goal is bigger than the library but the Library can have a large part to play. Common resources in the Library include datasets, software, computing, visualization/sharing/collaboration spaces and some quantitative expertise. Making these resources available to all students is a major step forward. The idea is supporting “data for non-majors” (e.g., non-statistics majors). The use of data is not a traditional strength of libraries; this is largely new territory, so it’s a learning process. It includes bringing in people who can build connections (e.g. a service/education-minded-data specialist) and engaging new campus partners to add their expertise.

**Strategic Planning**

Data Services has begun preparing a 2014 strategic planning effort to engage Library and campus constituents in defining how the program can best meet identified needs. Through the formalization of a vision statement and the development of a strategic plan, staff will continue to build support and working relationships within the Library, IS, institutional and community stakeholders (e.g. GIS working group, Big Data interests, campus researchers) to more clearly define the roles Data Services may play in supporting student, staff and faculty success. This will also allow for additional advancement and development opportunities.

**Final Words**

How institutions decide to define their roles in supporting this process at their institutions will vary greatly. Self-assessment is critical to how an institution’s data services develop. The major
reason for the success of Cal Poly’s program has been administrative buy-in and support. Making sure that there are appropriate resources and support is critical.

References
PARTNERSHIPS & COLLABORATION

MODERATOR: Guillerminda Cosulich, INIDEP (National Institute for Fisheries Research and Development, ARGENTINA

COLLABORATION FOR SUCCESS: A NEW LIBRARY/INFORMATION COMMONS AT THE MASSACHUSETTS MARITIME ACADEMY

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Massachusetts Maritime Academy, MA, USA

Mark Freeman
Perry Dean Rogers | Partners Architects, MA, USA

Abstract:
Using the Massachusetts Maritime Academy (MMA) Library building project as a model, this presentation illustrates the collaborative process necessary to bring a project for a new library and learning commons from inception through design, to construction, with an emphasis on the institution’s point of view.

Keywords: libraries, building, construction, learning commons, Massachusetts Maritime Academy.
PARTNERSHIPS AND COLLABORATION

AN INSIGHT INTO THE CONTRIBUTIONS OF PARTNERSHIPS AND COLLABORATIONS TO NaFIRRI LIBRARY FOR THE PAST SIXTY YEARS

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National Fisheries Resources Research Institute (NaFIRRI)
UGANDA

Abstract:
National Fisheries Resources Research Institute (NaFIRRI) is one of the Public Agricultural Research InstituteS under the National Agricultural Research Organisation (NARO) of Uganda. NaFIRRI Information and Data Centre has been in existence for over 50 years. Since its establishment, the Centre has been creating collaborations and partnerships at national, regional and international levels that have supported its growth. The library has benefited from these collaboration and from linkages with local and international institutions, individuals and many more. Networking with sister institutions also helps in keeping up to date with new findings in fisheries research, and enables the institution to be recognized internationally. This paper discusses and assesses the contributions made by collaborations and partnerships to the Library for the past 60 years, which have enabled it to continue to exist, grow and develop.

Keywords: partnerships, collaboration, information sharing, fisheries, libraries.

Introduction
National Fisheries Resources Research Institute (NaFIRRI) is one of the Public Agricultural Research Institute under the National Agricultural Research Organisation (NARO). The NaFIRRI Information and Data Centre has been in existence for over 60 years. It was established in 1948 to provide information to research scientists in East Africa. The Centre has evolved from a small library to a modern Information center.

The Library/Information and Data Centre is referred to as the heart of the institute because it contains all the institute’s reports from the time of its establishment to the present day. It also contains reports of the first surveys done in the 1920’s on Lakes Victoria, Albert and Kyoga. It also contains research information other lakes such as Edward, George, Kyoga, Nabugabo, Tanganyika, Chad, Malawi, River Nile, River Zambezi and many other satellite lakes in Uganda.

Given the limited budget it receives, the library has relied on support from collaborators and partnerships ever since its establishment. The library’s objectives include processing, documenting, re-packaging and disseminating research information to stakeholders while ensuring that all fisheries and aquaculture related research in Uganda is preserved and
conserved for further use. These goals cannot be reached without partnerships and collaborations, and they are what have made the library what it is today. It has benefited from collaborations and linkages with local and international institutions, individuals and many more. According to FAO (2009), sustainable fisheries information systems benefit from formal and informal partnership agreements.

I define partnership as an agreement between individuals, institutions or organizations to work together to share resources, given the fact that any single institution will not have all the resources that it needs. According to Carnwell and Carson (2009), current models of partnership are organized around professional identities, and will give way in the long-term to “problem specific” professions.

According to Carnwell et al. (2009), collaboration means the process by which people and organizations work together to accomplish a common mission. The benefits of partnerships and collaborations include:
- Information and knowledge sharing;
- Collaboration and partnerships provide access to Journals through the document delivery system;
- Networking and socialization;
- Improvement of service delivery.

Partners of NaFIRRI Library include national partners:
- Ministry of Agriculture, Animal Industry and Fisheries (MAAIF);
- Training Institute;
- National Environmental Management Authority (NEMA);
- National Library of Uganda;
- Makerere University Library;
- Consortium of Uganda University Libraries.

International Partners include:
- Freshwater Biological Association (FBA);
- FAO Fisheries Branch Library;
- IMF (International Monetary Fund);
- International Association of Aquatic and Marine Information Centers (IAMSLIC);
- Lake Victoria Fisheries Organization (LVFO).

**Contributions made by Partners**

According to the Annual Report of 1958, the library continued to receive regularly from the Soviet Academy of Sciences their Abstracts of World Literature on Biology and Biochemistry, a contribution the library gratefully acknowledged. These journals, according to the Annual Report, were valuable for purposes of reference to the titles of the papers published.
The work in the library by Mr. Elder and Mrs. Kemp in 1960 and 1961 resulted in the establishment of first-class working and reference facilities, which according to the annual report 1961 was then the only comprehensive hydrobiological library south of the Sahara still in working condition. Their contributions are greatly appreciated.

In 1960 the library was maintained by part-time staff but continued to expand to an International level. Accessions during the year totaled 12 reference works and several hundred reprints, and about 20 regular periodicals. The contribution of the part-time staff greatly contributed to raising the library to meet international standards.

The decimal classification was introduced in 1963 (Annual Report 1964) and the index of EAFFRO’s collection formed the basis of the bibliography of African freshwater hydrobiology that was being prepared.

On October 26th 1964, M. Michel Culas, representing the French Ambassador to Uganda, visited the Laboratory bearing with him a most generous gift from the people of France, three volumes *Agnathes et Poissons* of the French zoological work the *Traité de Zoologie* (Annual Report 1964). In the same year 115 feet of additional shelving was provided in the Library in order to accommodate the increasing number of Journals and reprints received each year.

During 1965 the library suffered from two difficulties: first, a growing backlog of the routine classification of reprints due to the limited senior and secretarial assistance available; and secondly, an increasing limitation on the purchases of essential books and reprints as a result of financial stringency. The rising costs of journal subscriptions, bookbinding and the printing of EAFFRO publications placed an increased burden upon the limited funds allocated.

In 1966, the Rockefeller Foundation financed the photocopying of journals, which the Library could not afford. This was an arrangement with the East African Freshwater Fisheries Research Organization, and improved the journal collection in the Library.

In 1970 the *African Journal of Tropical Hydrobiology and Fisheries* published its first issue and this was added to the Library. Contributions were also received from several scientists (EAFFRO Annual Report 1970).

Since 1960’s, the Library has received contributions from FAO. Including FAO Circulars, books, Fisheries Codes of Conduct and Technical Reports. There have been about 222 documents received from FAO to date.
Figure 1. A section of FAO collections in the library.

Other FAO contributions include the linking of the FAO Document Delivery program to the JLB Smith Library of South Africa and the South African Institute for Aquatic Biodiversity (SAIAB).

In 2010 through a partnership with the World Fish Centre Malaysia (Librarian Mr. William Ko), the Library received a donation of 230 books.

The Freshwater Biological Association (FBA) was responsible for sending early scientists to the East African Freshwater Fisheries Research Organization (EAFFRO). Through a partnership and collaboration with FBA, the library received copies of reprints, occasional papers written by the early scientists, the *Freshwater Forum Journal* and the Fresh Water Annual Reports. Through collaboration with CTA (Technical Centre for Agriculture), the Library has continued to receive copies of *Spore* magazine since 1970’s to date. Since 1975 the Library has received copies of the journal *Contributions in Science* though a partnership with Natural History Museum of Los Angeles County. The library has also benefited from the International Association of Aquatic and Marine Information Centres (IAMSLIC) since 2009 when the library became a member of the association. NaFIRRI has been able to access journal articles through holding libraries in the IAMSLIC network; to date we have received 35 copies of documents.

**National ASFA Partner**

The library is a National ASFA Partner; as such it is involved in preparing inputs and participates in ASFA activities. The library received a scanner from the ASFA Secretariat, which it uses for digitization. The ASFA Secretariat also pays the library’s IAMSLIC membership fee.
The Processing Unit For Digitization

![Image of the processing unit]

Figure 2. In 2012, through partnership and collaboration with International Monetary Fund (IMF) the Library has continued to receive copies of the monthly Finance and Development magazines.

National Partners and Collaborators

Through collaboration and partnership with Makerere University Library and INASP (International Network for Availability of Scientific Publication), the library has been able to receive document deliveries, hands-on training on how to access online journals, project planning and proposal writing skills.

In 2010 through collaboration and partnership with the National Library of Uganda, 50 copies of colonial maps and 5 historical books were digitized. The digitized copies are for internal use because of copyright issues. The librarian was also trained in digitization and description of cultural heritage materials in a workshop held between 4th-6th, October 2010.

Between 2002 and 2005, the library building was expanded and rehabilitated with support from the Lake Victoria Environmental Management Project phase one (LVEMP 1). It furnished the library with new furniture and books and supported project staff attached to the library to enable it to continue operating.
In the same period, 2002, through a partnership Sida Canada sent a Canadian intern, Mr. Palamar, to assist the library with the following activities:

- Kick-starting a scanning activity to create an electronic archive of materials relating to Lake Victoria.
- Providing electronic versions of all annual reports available from the Fisheries Resources Department/EAFFRO/UFFRRO/FIRI/FIRRI.
- Creating electronic materials from fisheries research Information to be used by Management Information system.
- Introducing the use of reference manager used at FIRRI to FRD and LVEMP website.
- Establishing electronic exchange of scanned information between FIRRI, FRD, LVEMP and KMFRI/TaFIRI.
- Completing negotiations with electronic journal database vendors to allow for access through 2002/2003.
- Organizing one to one workshops for scientists in the use of online databases for literature searching (IDEAL, Blackwell-synergy, EBSCO and other databases).
- Teaching scientists routine automated operations of the Internet.
- Overseeing the installation of database applications on the expected database and GIS equipment.
- Exploring possibilities for database linkages with KEMFRI and TaFIRI and recommend feasible mechanisms for Information and data exchange.
- Mr. Palamar was also assigned to follow up with a FAO Document delivery program linked to the J. L. B. Smith Library of South Africa, and ensuring that the FIRRI Library staff and internal were trained to take over library processes at the end of his stay. We are grateful for Mr. Palamar’s contribution to the development of the library.

In 2005, in partnership with Makerere University Library, NaFIRRI Library joined the Consortium of University Libraries (CUUL) as an affiliate. This was done to enable it to access electronic resources and also get access to information within the universities to which it may not have had access previously.

To date NaFIRRI Library is still a member of CUUL, and through the consortium the library staff have received training on accessing online Journals, project planning and management and training on writing winning proposals for Information management. The library staff have also benefited from short seminars in library management organized by the consortium.

NaFIRRI Library has also benefited as an institution of the Lake Victoria Fisheries Organisation (LVFO). Through its project IFMP the Library was able to receive books bought by the project to boost the number of books in the library in 2009. Through the collaboration with the LVFO, NaFIRRI Library has received donations of 154 books, for which we are grateful.
Between 2002 and 2005, the library building was expanded and rehabilitated with support from the Lake Victoria Environmental Management Project phase one (LVEMP 1). It furnished the library with new furniture and books and also facilitated project staff attached to the Library to enable it to continue operating.

*Figure 3a. The library after rehabilitation.*

*Figure 3b. Another view of the library after rehabilitation.*
Figure 3c. Another view of the library after rehabilitation.

The library also collaborates with the National Environmental Management Authority (NEMA), through which it has continued to receive copies of the State of the Environment Report since 1990. We have also benefited from the collaboration with Department of Fisheries Resources Uganda, from which we were able to get copies of policy books like Uganda Fisheries Policy, Department of Fisheries Annual Reports, and publications on standard operating procedures.

**Contribution of individuals**

Individuals who have undertaken further studies have contributed and donated copies of their theses to enrich the collections in the Library/Information and Data Centre. The theses and dissertations cover research in fisheries, aquaculture, water environment, socioeconomics and marketing.

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*Table 1. Contributions made by individuals*
The Uganda Bureau of Statistics in September 2013 donated 10 copies of the Uganda Demographic Health Survey Report of 2011 to the library to help increase demographic Information available within the library. The Economic Policy Research Centre at Makerere University Library has contributed books on policy research findings from within the University.

**Partnerships with Local NGO’s**
Since 2006 the Library has continued to receive copies of publications from the Advocates Coalition for Development and Environment.

**Conclusion**
Given the limited budget, the library cannot afford subscriptions to journals and e-books. Partnerships and collaboration have made us what we are today. We greatly appreciate and thank all those who have contributed to its growth and development.

**References**

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PARTNERSHIPS & COLLABORATION

TAPPING INTO COLLECTIVE INTELLIGENCE: MAKING A BIG PROJECT WORK AT A SMALL INSTITUTION

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Abstract:
The model of “collective intelligence” is one of the most important concepts for any librarian or information professional to grasp in the 21st century. In times of budget reductions and rapid technological advancement, the best research and most timely innovations cannot be accomplished in a vacuum. This paper outlines the concept of collective intelligence, its importance in the current academic landscape, and the experiences of the California Academy of Sciences in executing a major collaborative grant-funded project.

Keywords: Collective intelligence, innovation, academic libraries, collaboration.

One of the major challenges faced by librarians in small institutions is the burden of writing grants and executing meaningful projects in work environments short on staff and space, and high in demands and expectations. When so many resources are dedicated to everyday tasks, how does a librarian find the time and bandwidth to go above and beyond? One answer is through skillfully employing Collective Intelligence.

The way many think of collective intelligence is in the form of “consensus decision making” in the animal kingdom, which can take the form of the behavior of flocking birds, which do not appear to have a leader, but rather function as something of a self-organized system with individuals making adjustments and decisions in concert with their neighbors. The construction of nests in social insects such as bees, termites, or ants is another example of collective intelligence. There is also the means by which bees select the best fields of flowers from which to harvest nectar, and how they work their way systematically through the chosen area. These are situations in which huge numbers of very simple components (birds, bees, ants) can cope with extremely complex tasks and problems as a group, far above their capacity as individuals.

Collective Intelligence can be defined, simply, as the ability of a group to solve more problems than its individual members. Thomas W. Malone is the founding director of the MIT Center for Collective Intelligence. He says that “As all the people and computers on our planet get more
and more closely connected, it's becoming increasingly useful to think of all the people and computers on the planet as a kind of global brain.” The idea of working in the environment of the “global brain” is nothing new to most librarians, particularly the body of professionals in IAMSLIC; groups such as this exist because information professionals value collaboration and free exchange of ideas. However, most librarians have been part of a TERRIBLE collaboration. Librarians love to form groups and clubs and subcommittees and consortia, and sometimes it’s an utter disaster. Sometimes it is so awful that it’s easy to think about how much simpler it is to confront challenges alone and insulate oneself from the rough waters of collaboration.

Going alone is quite simply not a recipe for success. One will succeed in some areas, but the Lone Wolf strategy sets one up to fall short of major accomplishments. The example of the tiger is illustrative. Tigers are fairly solitary and they hunt alone. This makes sense as a stealth predator. Sneaking up on something is hard enough when alone, and nearly impossible as a group of giant, deadly cats hunting together. After a kill, a group of cats would then have to share the kill. Simply put, it is not economical for tigers to work together in this way, because FLYING UNDER THE RADAR is the defining element of this cat’s existence. To bring the example back to the Library and Information Management arena, one can consider the boss or coworker whose entire approach to life is to keep his or her head down and not draw any attention. Not only are such coworkers difficult to work with, but theirs also are often the first positions trimmed when budgets are tight.

There are downsides to the other extreme as well, illustrated via another zoological example, that of the Carolina Parakeet. Now extinct, it was the only parrot native to North America. Behavior exhibited in flocking, as mentioned earlier, is an example of collective intelligence and consensus decision-making. However, just as merely collaborating with peers will not solve all professional problems, the Carolina Parakeet’s flock behavior helped to lead to its downfall. These birds were known to flock together, to sleep in large groups in the hollows of trees, and if a member of the flock became injured, large numbers would crowd around the wounded party. These behaviors made it incredibly easy for farmers, who disliked the toll birds were taking on their crops, to net and destroy large populations at once. One could destroy a sleeping flock, or injure one bird and then net the dozens of others who would flock to its aid. The extinction of this species is directly related to a set of cooperative behaviors that failed to work advantageously under changing circumstances. The challenge all information professionals face is finding the correct balance and hitting the moving target. A librarian cannot be a tiger anymore, but must also avoid being a Carolina Parakeet.

When under pressure, people all tend to think the same way and deliver the same answers. It is not that those who answer differently are more intelligent or somehow better prepared for life, they are just approach this particular set of circumstances a bit differently. When librarians design projects, plan papers, and write software, the natural tendency is to target like audiences—these audiences generally being other librarians, primary patrons, and others encountered in the course of daily business. This is one of the reasons fruitful collaborations can be so difficult— if one’s work is a reflection of oneself, values, and what individuals find most important. It is easy to decide that this is easiest, and the correct way to operate. In other
words, people may react like Carolina Parakeets much of the time, but people also like being tigers.

Any dexterity this author may claim in navigating the Collective Intelligence landscape can be discussed in the context of a large, highly collaborative project operating out of the California Academy of Sciences. *Connecting Content: A Collaboration to Link Field Notes to Specimens and Published Literature* is a National Leadership Grant project funded by the Institute of Museum and Library Services (IMLS), for which the author serves as Principal Investigator. This project’s 21st century goals are well illustrated via a lovely 16th century image.

![Figure 1. Engraving from Ferrante Imperato, Dell’Historia Naturale (Naples 1599).](http://en.wikipedia.org/wiki/File:RitrattoMuseoFerranteImperato.jpg) (23 January 2008).

This image is an engraving showing the Natural History collection of Ferrante Imperato, an apothecary from Naples, who published this image with the catalog of his collection in 1599. The goal of *Connecting Content* is to bring everything in this room here conceptually together in a digital environment, under open access principles. One can think about today’s natural history museum as, in many ways, unchanged from what is shown in this illustration, There are specimens, of course, and related to those specimens, there are published materials, such as the books on the far right of the engraving. The young man with the right explaining the collections
to the assembled is said to Imperato’s son, who helped him write his observations of the collections—a scholar who composed significant pre-publication materials. All of these elements are intrinsically linked to each other, and there is special knowledge held not just in each element, but also in the **relationships** between these objects.

Through this project, scholarly institutions are harnessing unique content—specimens from biological collections and field notes from our archives, and digitizing them. All of this content lives in different places in a museum, and increasingly, more of this content has an online representation (or at least significant metadata). Project participants are creating or harnessing this content and connecting it to related published materials that are already digitized and served online via the Biodiversity Heritage Library. The Connecting Content project grew up out of the Biodiversity Heritage Library, a consortium of natural history and botanical libraries that cooperate to digitize and make accessible the legacy literature of biodiversity held in their collections and to make that literature available for open access and responsible use as a part of a global “biodiversity commons.”

The **Connecting Content** project operates out of a small library, one that cannot participate in such projects without finding other like-minded individuals and building strong partnerships. As mentioned previously, partnerships are not easy or self-sustaining. It is easy to join a consortium and not do any work. It’s also easy to join one and find yourself in over your head. There are six institutions participating in the Connecting Content project, and they all members of and contributors to the Biodiversity Heritage Library. This gives the institutions a close relationship, but they also have access to BHL resources and expertise—for example, that is why the project serves content via the BHL portal. It makes sense for BHL, it makes sense for **Connecting Content**, and the projects do not squander resources building a new delivery system.

As part of **Connecting Content**, the participating institutions have created pilot projects, themed collections of archival and specimen material, to digitize and contribute to the project as proof of concept. Part of what makes this collaboration interesting and useful is that each of these organizations possesses varying built-in resources, workflows, and procedures. Partners learn from each other and create projects that are scalable and extensible. This does not mean that the project is simple, but some problems have been solved via robust collaboration. To the scientific staff of a natural history museum, the idea that there are direct, multi-way relationships between specimens, field notes, and published literature makes perfect sense. In fact, the project was inspired in part by the fact that researchers regularly visit institutions to begin work in one department and end up being traded off between different staff members who serve as custodians of different pieces of the collections puzzle. For example, someone may come in through the herpetology department looking at specimens. It is very common for that person to consult the published literature as well, a new wrinkle that probably involves working with library staff. At some point in the process, the researcher may have a question about something written in the published papers or discovered in relation to a specimen, which may then require a look at the original field notes documenting the collection activity itself. Those field notes may live in the Archives. They might be in the Herpetology department. They might
be the field notes of someone who collected in more than one discipline, in which case those
erpetology notes might be in the ornithology department. At least three different members of
the scientific staff have become involved in the answering of this question. Connecting Content
is, on its face, an attempt to streamline this process and co-locate information about the same
item in a manner that is easy to find.

The project partners thought this would be fairly simple, at least on a conceptual level. A great
deal of preliminary work with collections managers and curators took place before any
digitization work took place, but some issues were overlooked, stumbling blocks that that in
hindsight should have been obvious. The project partners failed to exploit collective intelligence
properly. A big problem was how to use a display mechanism and service designed to serve
published books and journals to deliver archival content, a challenge the partners dubbed
“fitting the archives peg into a book-shaped hole,” and it was never satisfactorily resolved. The
emphasis on creating new digital content (digitizing field notes and specimens) required so
much energy and that it took a programmer not working on this grant to call attention to
problems related to item display and provision of metadata. It took another archivist to raise
conceptual questions about original order and artificial collections.

Rollo Beck Galapagos expedition journal, Beck, Rollo Howard, 1870-1950 text
book English (1905-1906) 1870-1950 Archives Beck, Rollo Howard, Birds
California Academy of Sciences Collection and preservation Expedition of the
California Academy of Sciences t Field notes Galapagos Islands Scientific
Expeditions South America Zoological specimens Connecting content : a
collaboration to link field notes to specimens and published literature. National
leadership grant/ Institute of Museum and Library services.
http://www.biodiversitylibrary.org/bibliography/59676 777220765 CAW

Figure 2. Text Of the MODS Record For One Of the Connecting Content Field Notebooks;
Served via the Biodiversity Heritage Library.

Considering a MODS record created for this project, one can see it is not a robust chunk of
metadata. An item from an archival collection is not really meant to stand alone as an item the
way a monograph does. Archival materials are meant to be taken in context with the other
items in the collections, and that is not really possible using the BHL interface and book viewer.

Other problems arose around content creation. Digitizing field notes is fairly straightforward, as
the task can be accomplished using a flatbed scanner, a camera stand for overhead
photographs, or a book scanner. It may not be cheap or fast, but it is inherently doable. But,
several of the grant partners, including the California Academy of Sciences, are digitizing bird
specimens as part of their pilot projects. How does one digitize a bird? What visual information
do people need to find an image of a bird specimen useful? Each institution developed different
methods to capture as much useful information as possible. Since this is a highly collaborative
effort, and the idea is that each pilot project could serve as a model for other institutions to try
their own projects is key. With institutions of varying sizes and institutional capacities
contributing pilot projects, the hope is that this will demonstrate scalability. Success in this project will be to see other institutions learn from Connecting Content’s mistakes and find a description and digitization model in one of our pilot projects that works for them.

So far in the discussion of Connecting Content and learning, the “student” at this point is not the end-user, but rather the grant partners—other librarians, archivists, and scientists. However, these individuals are not the key learners and the target audience for this project.

To return to another zoological metaphor, this is *Cactospiza pallida*, or *Camarhynchus pallidus* (depending which name the reader accepts as valid), a species of finch from the Galapagos archipelago, one of the varieties of finch collected by Charles Darwin during the Beagle voyage. This particular species of finch actually uses tools. In addition to serving as examples of specialization via natural selection, these finches have shown the ability not just to use tools, but to change their tool use on the fly to obtain food from various containers designed to force them to adapt their behaviors. It is important to keep organisms like this finch in mind when considering who is served by a project like Connecting Content, and how those patrons are creative, flexible, adaptable, and in many ways, at least one step ahead of the librarians and information professionals spearheading such projects. In fact, the missing piece of many successful collaborations is how to tap into the communities of users in ways that make projects better. IMLS calls this concept “putting the learner at the center” and it is a key piece of the Connecting Content puzzle. During the crafting of the Connecting Content proposal, an IMLS program officer told the partners that nobody needs another portal. So instead of creating terabytes of content and serving it via a static online portal, the aim for deliverables is to turn to
some major user communities for the creation of third-party web applications that harness the created open content. In some ways, the final grant deliverable is a product not designed by the participants in the project. As mentioned earlier, the easiest projects are designed to serve reflections of oneself, and this group decided early that the best way to avoid creating yet another tool or resource destined to rot away unmaintained after the money ran out was to put faith into the hands of the target audiences and see what sort of user generated, creative, non-prescribed, fast, lightweight, inventive tools and services these folks could come up with. An oft-repeated mantra for this project is that it is built upon the concept that is not the job of the content creator (the librarian, archivist, or scientist) to tell the user what to do with the data. These professionals know how they want to use their data, but that is of little use to those outside those communities. As the Connecting Content project draws to a close in the Spring of 2014, the partners must confront how to deliver on promises made. Much of the linking promised is based on the ability of users to have the datapoints required for useful links. When working with handwritten, nonstandard materials, the generation of those datapoints is often based in human work, involving transcription (for example). This is another learning experience for the project partners, and a stark reminder that while the community has figured out some things about digitization, data delivery, and automation, there is a long way to go. The low-hanging fruit is running out, and climbing further up the tree is not easy. The project has employed students and interns to work on identifying the scientific names in the field note scans, and tagging the pages in BHL with those names so that the BHL discovery tools can incorporate the field notes into species bibliographies, even though the pages do not have usable OCR text.

It is important to keep in mind that what people want and what we currently have the institutional capacity to deliver are widely different things. There is a quote from an episode of Doctor Who from the 1970s: “Answers are easy. It’s asking the right questions which is hard.” This sums up why librarians and information professionals need to not only build robust collaborative relationships with peers, but also break the mold by offering a larger, participatory role to users. One cannot really tap into the collective intelligence of a user community without clearly defining your problems. And the easiest way to define those problems is via users.
Figure 4. Image of Rollo Beck Field Notes from the Biodiversity Heritage Library (left) With the uncorrected OCR (right). http://biodiversitylibrary.org/item/121726 #page/6/mode/1up. (1 October 2013).

References


OUTREACH

Moderator: Ruth Gustafson
University of California Davis
California, USA

BIOLUMINESCENCE: AN ADVENTURE IN LEARNING AND OUTREACH

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Abstract:
In spring 2012, the Ernst Mayr Library – Museum of Comparative Zoology (MCZ) received a grant to purchase and place three exhibit cases in the heavily traveled lobby of an adjacent science building. The purpose was to highlight the connections between library resources and research at Harvard. The second exhibit, Bioluminescence, was especially ambitious and involved multiple departments and University entities, raising and broadening the library’s profile and enhancing recognition of its value. A LibGuide (http://guides.harvard.edu/Bioluminescence) was also created to accompany the exhibit. Since bioluminescence is especially widespread in the oceans, it is of interest to IAMSLIC members, and the paper briefly outlines the subject – what it is, how it works, what organisms use it and why. The paper also discusses how valuable collaborations with faculty, staff and researchers were forged and enhanced in the process of creating the exhibit.

Keywords: Bioluminescence, aquatic sciences, libraries, collaboration

Introduction
During the period from 2011-2013 the Harvard Library, with funding from the Arcadia Fund (http://www.arcadifund.org.uk/), sponsored a number of “Library Lab” projects (https://osc.hul.harvard.edu/liblab). The purpose was to encourage innovation and cooperation across the libraries. In spring 2012, the Ernst Mayr Library – Museum of Comparative Zoology (MCZ) received a Library Lab grant to purchase and set up three exhibit cases in the lobby of an adjacent science building that houses multiple departments. The purpose is to highlight the connections between library resources and research in the biological sciences. We also wanted to reach out to not only the Harvard community but beyond; a cafeteria at the other end of the lobby serves the public as well as faculty, staff and students. The exhibits, which rotate every six
months, offer opportunities for scientists to do outreach and to showcase their research. It also broadens the library’s exposure and showcases its resources and expertise.

The second exhibit was on Bioluminescence. Organizing the exhibit offered an opportunity for the author to step outside the physical library and work directly with staff, faculty, and researchers in the Organismic and Evolutionary Biology Department (OEB), the Molecular and Cellular Biology Department (MCB), and the MCZ. Highlights of the exhibit and the LibGuide that was created along with it are discussed here.

The Project
Although two exhibit cases were originally budgeted, a chance conversation with the Exhibits Director of the Harvard Museum of Natural History (HMMH) led to her suggesting that she and her team could custom build the cases for us. In the end they were not only able to build three cases for the same amount, there was enough money left over to provide ongoing support. This is important because the case covers, which are UV protected acrylic, are very heavy and require two strong men and special tools to remove. On the plus side, of course, this means that the cases are very secure and the objects inside are protected.

Because of the configuration of the space, two tall cases with display areas approximately 33”W x 20”D x 42.5”T were built to flank one long, low middle case, approximately 60”W x 23.5”D, with a slanted cover 19.5” tall in back and 10” in front. There is locked storage space under the tall cabinets.

The grant also provided for graphics. The MCB Graphics Department created and printed all the signage for the exhibit, and these added a great deal of visual interest to the displays.

The first exhibit was done by Lisa Decesare of Harvard’s Botany Libraries, who is experienced in creating displays. The subject was Wood, and it was in place for three months. The original plan was to rotate exhibits every three-four months, but since the subsequent exhibits have become more elaborate and inter disciplinary, requiring more planning and involving more people, the timeline has changed to a minimum of 6 months and longer as needed.

The second exhibit was on bioluminescence. The topic was chosen because of the recent retirement of J. Woodland (“Woody”) Hastings of Harvard’s MCB Department, an acknowledged expert on the subject. His retirement coincided with the publication of his new book on the subject (Bioluminescence: Living Lights, Lights For Living) written with Therese Wilson (Wilson and Hastings, 2013). The low middle case was devoted to the book, with eye-catching graphics and a brief excerpt.

Deep-sea fishes were the subject of one of the two flanking cases since many of them bioluminesce. The author had earlier attended a seminar given by Chris Kenaley, a postdoc in George Lauder’s lab in the Ichthyology Department of Organismic and Evolutionary Biology. He works on loose-jawed dragonfishes, which are among the many deep-sea fishes that are
bioluminescent. When approached, he was enthusiastic about contributing to the exhibit, and shared material and photographs. Karsten Harter of the MCZ Ichthyology Department found specimens of the fishes in the photographs and arranged them in jars in the same positions as in the photographs. A mid-19th century book open to a charming line drawing of one of the fishes completed the exhibit.

The second tall case was set up with specimens from various departments in the MCZ, including Entomology (e.g., fireflies), Invertebrates (e.g., *Aequorea*) and Mollusks (e.g. the bobtail squid). There was also a tool called a BioScan made by GE. This small instrument uses bioluminescence to measure bacteria in water simply, accurately and almost immediately. This is a big improvement over conventional methods that require culturing and take hours or even days to give results. There were also colorful graphics in the cases to add visual appeal, and text was minimal.

**What IS Bioluminescence?**
Bioluminescence is biological light – light generated by living organisms. It involves a chemical reaction so efficient that it emits hardly any heat. A form of phosphorescence, it is different from fluorescence, which ceases when the illumination that causes it stops. Bioluminescence has evolved independently at least 40 times and has fascinated humans for centuries. Today it is being utilized in many ways, from medicine to warfare to biotechnology. Recent research has uncovered more and more bioluminescent organisms, especially in the deep oceans.

As Wilson and Hastings (2013) point out, bioluminescent organisms are scattered widely across the tree of life, though by no means all of the organisms in any group luminesce. Thus bioluminescence is found in some mushrooms but no plants; many fish but no other vertebrates; and essentially no freshwater organisms (only one is known, a tiny snail from New Zealand, though it’s not clear why there aren’t more). Of course, we don’t know how many times in the past it may have evolved and then disappeared.

On land luminous animals include fireflies and other beetles, especially elaterids or click beetles; larvae of some flies; a couple of centipedes and millipedes; a snail; some earthworms; and that’s about it. Bioluminescence is common in the oceans, however. Haddock, Moline and Case (2010) speculate that the reasons include relatively stable environmental conditions; optical clarity compared to other aquatic habitats; comparatively large areas that receive little or no light; and a multitude of organisms interacting. As mentioned, one of the three cases in our exhibit was devoted to deep-sea fishes, and another included other marine organisms.

**The How and Why Of Bioluminescence**
Simply put, bioluminescence is produced within cells by chemical reactions. It involves the reaction of oxygen with specific molecules that vary in different groups of organisms, and requires specific enzymes to catalyze the reactions.
At least two types of chemicals are involved in every bioluminescent reaction. *Luciferin* is the generic term for the light-emitting molecule and is the component that produces the fuel for the chemical reaction. The enzyme that acts as the catalyst to create the glow is called a *luciferase*. Luciferins are highly conserved - they tend to stay the same within a group over time. There are only five types known, of which the most common is *coelenterazine*. It is found in nine different phyla, and was first discovered in the jellyfish *Aequorea, a specimen of which was included in the exhibit.*

While luciferins are conserved, luciferases are diverse - within a group there may be many different ones. They do tend to be species-specific, however.

For bioluminescence to have evolved independently so many times, and for it to be so widely distributed across taxa, it must serve definite purposes. There is an excellent chart on the uses of it by organisms in the oceans at [http://www.lifesci.ucsb.edu/~biolum/functions.html](http://www.lifesci.ucsb.edu/~biolum/functions.html) (from Haddock et al. 2010). Below is an edited summary:

- Communication/mate attraction/recognition. There are many examples found in the oceans. They include octopus; squid; lanternfish; flashlight fish; anglerfish; ostracods; polychaetes; and others. (Fireflies provide another obvious example. They signal to attract mates, though some females - aptly dubbed femme fatale fireflies - mimic the signals of other species to attract males, who arrive hoping to mate and instead find themselves becoming dinner.)
- Luring, confusing or illuminating prey. Anglerfish and other deep-sea fishes attract prey with dangling luminescent lures. Squid and perhaps headlamp lanternfish flash to stun or confuse prey. Flashlight fishes anddragonfishes bioluminesce to illuminate prey.
- Defense. This is used in different ways by many ocean organisms, such as:
  - Camouflage. Counterillumination is very effective in warding off attack from below; looking up towards the light from above, a predator may not see an animal that is luminescing.
  - Startling. A sudden flash may startle a potential predator and allow the proposed victim to escape.
  - Misdirection. Many ocean organisms bioluminesce to deceive predators. They include crustaceans, polychaetes, squid, ctenophores, some fishes, and more.
  - Distraction. *Octopeuthis* squid, brittle stars, polychaetes and siphonophores among others luminesce to distract predators, prey or even both.
  - Sacrificial tag. Some sea cucumbers, jellies and polychaetes do this; illuminate a disposable body part, drop it and escape while the predator concentrates on the glowing bit left behind.
  - Burglar alarm – to warn others of its kind. Dinoflagellates and jellies definitely do this.
  - Warning – “don’t eat me / settle on me, you’ll be sorry.” Jellies send this signal, and perhaps brittle stars and others as well. Bioluminescence used in this way can be regarded as an aquatic equivalent of aposematic coloring on land.
Some Examples Of Bioluminescent Organisms

*Figure 1. Diaphus metopoclampus, the Spothead Lanternfish. Photo © President and Fellows of Harvard College.*

Dragonfishes and hatchetfishes (Stomiiformes) are characterized by elaborate arrangements of photophores. They may sport barbels, photophores under their eyes, and others along their ventral (underneath) sides. A few stomiatoid fishes such as *Malacosteus niger* have photophores that produce two radically different frequencies of light: one behind the eye that produces blue light and one under the eye that can produce red light. This is unusual because long wave red light dissipates more quickly as it passes deeper into the ocean, where short wave blue-green light is the norm. Using specialized pigments capable of perceiving red light, fishes like *Malacosteus niger* can communicate with one another via a private wavelength and can also visualize prey.

*Figure 2. Echiostoma barbatum. The Threadfin Dragonfish, a Stomiid. Photo © President and Fellows of Harvard College. Photo on right, by Chris Kenaley, is of a freshly caught specimen; note especially the glowing barbel.*
*Himantolophus albinares* is another luminous deep-sea fish. Popularly called the football fish because of its soccer-ball-like appearance, it is an anglerfish in the group Lophiiformes. It produces light at the end of its modified dorsal ray using bacteria.

![Image of Himantolophus albinares](image)

*Figure 3. Himantolophus albinares - AKA the Football Fish.*
*Photo © President and Fellows of Harvard College.*

The Bioluminescence exhibit was so successful and the relationships that were developed were so rewarding that the next exhibit was even more ambitious. The subject, Time, was chosen to complement an exhibit at the Harvard Museum of Scientific Historical Instruments (HMSHI) ([http://chsi.harvard.edu/](http://chsi.harvard.edu/)) on Time. That exhibit covered all aspects of the subject – clocks, timekeeping, etc. - so we decided to focus on biological aspects. After reading a paper published by researchers in MCB on circadian rhythm in cyanobacteria, the author contacted the lab members, got a positive response, and met with a postdoc to talk about it. Before long it was obvious that there was a great deal of other relevant research in the University, and in the end members of four labs, two in MCB and two in OEB, were involved, and those graduate students and postdocs contributed greatly both to the exhibit and to the LibGuide.

On display were a vial of cyanobacteria and a petri dish of *C. elegans* babies, which are too tiny to see with the naked eye so a magnifying glass was propped over them to emphasize their size. There were also short explanations, splashy graphics, old drawings from the Library's collection and specimens from the MCZ. These included a box showing the life cycle of cicadas; fossils from the MCZ Invertebrate Paleontology collection; a hagfish from the MCZ Ichthyology department; a bird from the MCZ Bird collection mounted in the same position as a model of a predatory dinosaur to highlight the similarities; and models of Burgess Shale creatures from the HMNH Education Department. The middle case was a timeline of biological life on earth, beginning with cyanobacteria and ending with the demise of the dinosaurs. The LibGuide is [http://guides.library.harvard.edu/Time](http://guides.library.harvard.edu/Time).
Conclusions
The faculty, graduate students and staff members who contributed to the exhibits benefitted by having their research publicly highlighted. The Library enhanced its profile and received exposure beyond its walls that continues with use of the LibGuide. And most of all, the librarian forged new relationships and strengthened existing ones, to the benefit of all.

References
OUTREACH

CREATING A BRIGHT FUTURE:
A LIBRARY MOVES SCIENCE LEARNING FORWARD!

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Abstract:
A key mission of Wisconsin’s Water Library at the University of Wisconsin-Madison is educational outreach to state residents of all ages to heighten awareness of the Great Lakes and of Wisconsin's water resources. A successful project as part of this mission is outreach to children ages three through ten. Over the past five years, the Water Library has used award-winning literature and science-based activities to introduce marine and aquatic sciences concepts to preschoolers and students in the early elementary years. This paper provides background on the library’s experience in outreach and highlights two successful ongoing collaborations where educational outreach is offered to under-represented minority children.

Keywords: Science - study and teaching (early childhood); children - education (preschool); water - study and teaching - activity programs; children’s literature; libraries and minorities.

Introduction
In his book Last Child in the Woods (Louv 2005), journalist Richard Louv has written extensively about how the preschool and early elementary years offer a critical window to reach children with age-appropriate messages about ecosystems. This is especially important for children from disadvantaged households where the opportunity or means to explore the natural world is often limited. Libraries have a longstanding role in providing key services to this age group in support of literacy and kindergarten readiness (Diamant-Cohen, 2007). As an extension, the library could have a unique opportunity to also provide STEM (Science, Technology, Engineering and Math) literacy in a similar way. Libraries are seen as neutral brokers of information, which fits nicely with the tenets of science education. Children of this age group don’t necessarily differentiate between literature- and science-based learning, so inclusion of STEM activities would be fairly seamless.

A large part of the educational outreach mission of Wisconsin’s Water Library at UW-Madison is teaching about marine and aquatic sciences for children ages three through ten. This paper will introduce the library’s outreach program in general, will demonstrate the evolution of its STEM
literacy story times and will highlight examples of successful collaborations that have resulted in ongoing work with two underserved communities – the Ho-Chunk Nation (Wisconsin Dells, Wisconsin) and the Allied Drive Neighborhood (Madison, Wisconsin).

**About Wisconsin’s Water Library**
Wisconsin’s Water Library at the University of Wisconsin-Madison was established in 1964 by the UW Water Resources Center. Its mission is to “collect, preserve and provide resources about the waters of the Great Lakes and Wisconsin, in support of the UW Aquatic Sciences Center (ASC).” The ASC is headquartered in the Graduate School of the University of Wisconsin-Madison. The ASC administers two institutes with complementary missions. Both the Sea Grant Institute, sponsored by NOAA, and the Water Resources Institute, sponsored by the U.S. Geological Survey, support multidisciplinary research, education and outreach for the protection and sustainable use of Wisconsin’s water resources.

The Water Library accomplishes its mission in three distinct ways. First and most importantly, the library participates in outreach to Wisconsin residents of all ages to heighten awareness of the Great Lakes and Wisconsin's water resources. Second, the library supports the educational and research activities of the Aquatic Sciences Center by providing traditional library collections and services as part of the Center’s mission. Third, the library has a preservation function - projects are completed that preserve its unique collections for future as well as historical value, whether in digital or in print.

**Library Outreach**
As an outreach library, most of the services the library provides fall under the umbrella of “educational outreach to Wisconsin residents.” These activities occur most often in informal educational settings such as in community centers or public libraries. Some of the events are held around the UW-Madison campus. The library does not generally work in formal educational settings such as elementary or high school classrooms. Some of these informal education outreach activities are initiated by the active UW-Madison Science Alliance ([http://www.science.wisc.edu/index.htm](http://www.science.wisc.edu/index.htm)), a group of researchers, outreach staff and volunteers who organize public science outreach events and programs for the University. The Alliance works with collaborators including scientists, university departments and centers, K-12 educators, to offer events via community venues throughout Wisconsin. The Alliance was launched in 2003 at the beginning of the Centennial of the Wisconsin Idea, the commitment that all the people of Wisconsin should benefit from the work of the University.

*Photo by Moira Harrington*
An example of this type of informal education event sponsored by the Science Alliance was an evening high school science fair where the library traveled with 50 or so other science entities from UW-Madison to Marinette, Wisconsin in the far northeast corner of the state. The library staffed its own booth with a theme of “Great Lakes Fish” in honor of this Lake Michigan port city. The library displayed children’s and adult books about Great Lakes fish and offered attendees the opportunity to use a dichotomous key to identify native species from the Great Lakes. The library participates in 5 to 10 events like this per year. Themes of past events have included hypothermia, remotely operated vehicles (ROVs), and aquatic invasive species, as well as the fauna and flora of the Great Lakes. This type of outreach event is a more passive activity, where attendees wander by and participate in the activity as interested. These events are busy, with library staff interacting with up to 100 people over the course of couple of hours.

Another example of informal outreach is the library’s participation in classroom-oriented events like “Expand Your Horizons” (EYH) (http://www.eyh.wisc.edu/) on the UW-Madison campus. EYH is a national program aimed at middle school girls, to encourage their interest and inspiration in STEM (Science, Technology, Engineering, and Math) careers. As part of the computer science track, the library offers a one-hour tutorial on the technology aspect of science librarianship while teaching how to research the safety of bottled water. The library is able to take advantage of educational outreach in a more structured environment of a classroom, typically working with up to about 50 people per event. The participants are often children or young adults, but some events may include programs with mixed ages, such as the Limnology Major of Grandparents’ University (http://www.uwalumni.com/home/gpu_majors.aspx#lim).

**Preschool Outreach – First Generation**

The library’s largest effort on outreach, however, is the work we have done in STEM literacy for preschoolers and early elementary aged children. This effort began in earnest in 2010. That summer the theme of the Collaborative Summer Library Program (CLSP) in public libraries across the country was “Make a Splash!” The CSLP is a reading program offered by a consortium of states working together to provide high-quality summer reading program materials for children at the lowest cost possible to their public libraries. Each summer a theme is chosen and programming and activities are offered centered on that theme. In late 2009 the Water Library was contacted by the Wisconsin Dept. of Public Instruction (DPI), the coordinating agency for the CSLP in Wisconsin. In response to their
request, the library developed a roadshow of story times and activities for preschoolers on a variety of water-related themes, including frogs, fish, ponds and water science. During the summer of 2010, the library reached approximately 600 children at 20 events. The library structured story times much in the accepted practice for preschool story times in public libraries. The theme is presented, books are read, movement and song are included and a final craft is created, all centered on the theme. The library had great success during this period because the marketing of the events was handled by the built-in promotion of the CSLP. Because we used the tried and true method of story hours, the feedback from attendees was very positive.

**Second Generation Outreach – STEM Included**

As we continued to lead story times for children based on a literacy model, the library decided to expand what we were offering to include more direct instruction on marine and aquatic sciences. We accomplished this by adding interactivity and hands-on learning during the story time, focusing out presentations on science rather than on literature. We wanted to take advantage of children’s innate curiosity and enthusiasm for experimentation within the literacy model. Children naturally do science through play – they experiment and observe and question without prompting.

The transformation was fairly painless. The library took the existing outline for the story times, changed the language used and added more opportunity for interactivity. To start, the librarian would introduce the theme of the event with a focus on the science and an introduction to the relevant scientific terms. A good example that illustrates the integration of science and literacy is our first attempt at a STEM-based story time, “What sinks and what floats?” When we introduced boats and boating as our theme, a spirited back and forth discussion followed with a debate about why a human being would sink and why a heavy boat would not. If the library was working with school aged children, a discussion of the concepts of buoyancy, displacement, density would follow. After the literacy piece, the group would proceed to tables and the children would have a chance to be scientists and test for buoyancy. The children would hypothesize, test and record an experiment trying to figure out what household objects sink and what float. The story time finished with the construction of a sponge boat the children could test and then take home from the event.

**Outreach At Allied Drive**

As Richard Louv wrote in his books, children from disadvantaged populations have fewer opportunities and reduced means to learn about the natural world around them. With this in mind, the Water Library began collaboration in 2004 to bring literacy story hours to the Allied Dunn’s Marsh Neighborhood, a geographically isolated in Madison, Wisconsin. With a collection of children’s books bought with a grant from the Friends of UW-Madison Libraries, special
librarians from across the campus participated in story times at the Allied Drive Learning Center, the community center in the area that houses the Head Start program, after school activities and other student-focused activities. Not only is the Allied Dunn’s Marsh neighborhood geographically isolated, the children in this area attend a variety of school across the area and have no direct access to public library services. The Learning Center is now a de facto center for community building among the neighborhood youth as well as a learning center for children of all ages. The story hours are a welcome addition to the suite of educational outreach through the Center and the collaboration continues today. In fact the activities initiated at the Center are now codified into the library school curriculum at UW-Madison. Students interested in youth librarianship take a fall course that includes a service learning component at Allied Drive.

STEM Literacy With the Ho-Chunk

Building upon the success of the Allied Drive story times and the frequent visits to the public libraries in Wisconsin the library expanded its outreach offerings to a Native American community located about an hour from Madison. The Ho-Chunk Nation, found in parts of Wisconsin, Nebraska and Iowa, is known as the “People of the Sacred Language.” The library approached the tribe with an offer to work with the children of the Head Start program in Wisconsin Dells, which serves 21 children ages 3 to 5 each day. The purpose of Head Start is to serve children from low income families, children with disabilities and families with other at risk situations to help children prepare for kindergarten. The Head Start education content areas address improving language skills, number and reading readiness skills, self-help skills, and fine and gross motor coordination.

The library wanted to work with a Native American community for several reasons. The library school at UW-Madison has a long-standing relationship with the Native peoples of Wisconsin and is considered an ally in library services and “culture keeping”; the library wanted to broaden its work with underrepresented communities; and finally the library wanted to complement the tribe’s strong connection to the land. The library began its visits in 2010 and has visited the Neenk Chunkgra Head Start Center in the Dells bimonthly since then. The Water Library is hoping to expand on this collaboration in the coming year.

References
RESEARCH DISSEMINATION

Moderator: Barbara Butler
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DISTRIBUTION, USE AND VISIBILITY OF SEAFDEC AQUACULTURE
DEPARTMENT PUBLICATIONS: INITIATIVES OF THE LIBRARY

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Southeast Asian Fisheries Development Center (SEAFDEC), Philippines

Abstract:
The Southeast Asian Fisheries Development Center (SEAFDEC) is a regional treaty organization established in 1967 to promote fisheries development in the region. The Aquaculture Department (AQD), based in the Philippines, is mandated to conduct scientific research to generate aquaculture technologies relevant and appropriate for the region; develop human resources; and produce, disseminate and exchange information on aquaculture. In 2009, the Library and Data Banking Services Section identified its information dissemination and services target: to improve accessibility to archived and updated information produced by SEAFDEC/AQD and to increase its visibility. The library has established an exchange program and resource sharing agreements with various universities and institutions in the Philippines, Japan, Southeast Asia and other countries outside the region. It also developed SEAFDEC/AQD Institutional Repository (SAIR), where one can download scholarly work of the Department. The library is a member of the International Association of Aquatic and Marine Science Libraries and Information Centers (IAMSLIC). In 2012, it joined IAMSLIC Z39.50 Distributed Library and currently the only Asian library included in the Z39.50 Broadcast Search of Catalogs. This paper discusses the experiences of SEAFDEC/AQD Library in its document delivery, resource sharing and interlibrary loan activities, and also describes how the library adopted recent technologies to enable scientists, students and the general public to access and make use of aquatic and marine science information. Decision-making based on evidence and statistics, and the strategies and innovations made by the library, will be described. The uses of social media, email and IR have been found to be innovative and cost effective ways to deliver information. The
paper could be of value to other institutions and organizations considering similar collaborative efforts and international relation activities.

**Keywords**: Fisheries, Southeast Asian Fisheries Development Center, Philippines, library exchange programs, institutional repositories
RESEARCH DISSEMINATION

USING OPEN SOURCE SOFTWARE FOR REPOSITORY AND LIBRARY CATALOGUES: 
THE EXPERIENCE OF SOME AFRICAN MARINE LIBRARIES

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Abstract
To enhance preservation and sharing of e-resources, enable web publishing of local resources, and upgrade delivery of services, some African marine librarians use the AgriOceanDspace software to develop online library catalogues as well as institutional repositories. This paper will describe the objectives of this initiative, the process, the ongoing results and the challenges faced.
SPOTLIGHT ON FLORIDA

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WHAT LIES BENEATH: A SPECIAL COLLECTIONS ODYSSEY

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Abstract:
One of the challenges in transitioning into this new digital world has been in deciding when and where we enter; how much of our small specialized collection will make this transition, and how much of it will remain in print? When the Rosenstiel School of Marine and Atmospheric Science (RSMAS) Library embraced the myriad changes of the library world with open arms, we soon discovered that remnants of our not so distant past were amongst our collection and vital to our future. This odyssey focused on uncovering the primary sources, the reports, documents, images, and oral histories that chronicled the marine school’s history, and how we endeavored to make this history accessible for generations to come.
SPOTLIGHT ON FLORIDA

CONSOLIDATING THE RECORD:
A BRIEF HISTORY OF ENVIRONMENTALISM IN FLORIDA

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Abstract:
This paper describes the activities leading to the development of a subject-specific collection guide that will be utilized by students, researchers, and the public. The information in the Guide is the foundation of a collaborative project to create an annotated list of environment-related collections, materials and organizations in Florida with specific attention to the southern part of the state.

Keywords: Florida, libraries, archives, collections, environment, nature.

Background
Over the last five to six years, libraries have been reviewing the significance of their resources and collections and ardently examining ways to reinvent themselves. In 2008 the director of the Mote Marine Laboratory Library initiated actions to add value to Mote’s one-person Library. First, the term “Archives” was added to the name of the Library. Next grant proposals were written and received for basic processing of the archival and special collections that were housed in long-term storage. These collections contained ninety years of environment-related, primary source data associated with Southwest Florida and beyond. A component of the grants involved the digitization of various items from the collections and addition of the e-documents to Mote’s institutional repository (IR). The final phase entailed promotion of the collections. Brochures were developed and distributed, and presentations were given at local organizations and professional conferences. Following the promotional activities there was interest in and requests for materials from the collections. However, to validate the rationale for maintaining the archives, a broader patron-base was needed to increase usage.
The need to promote the collections along with two other incentives prompted the compilation of a subject guide of environment-related collections. Students, interns and novice researchers may not always know where to begin a literature search for valid environmental information, and they may not be knowledgeable about the reliability of the sources they find. Numerous librarians have noted this as students, the public and other patrons venture into the library seeking materials to meet their information needs.

A second motivator was the following statement in the 2013 report titled *Field Stations and Marine Laboratories of the Future: A Strategic Vision*: “The more than 500 FSMLs around the world, and the long-term records they maintain, make it possible to study environmental processes at multiple spatial and temporal scales.” This statement enforces the fact that the materials held in libraries, archives and digital repositories are vital to present and future global environmental challenges. Further, preservation of and access to the scholarly environmental record is critical. The valuable content these collections contain can provide a basis for people to manage ecological resources and maintain a sustainable environment. (This report was developed by the Organization of Biological Field Stations [OBFS] and the National Association of Marine Laboratories [NAML] to help field stations and marine laboratories anticipate and prepare for the future needs of science and society.)

The overall objectives were to compile a guide of environmental collections and materials in Florida, with attention to the southern part of the state; have it freely available online for students, researchers and the public; and enhance usage of archival collections. It was at this phase that colleagues, interns and volunteers were enlisted to help compile the publication.

**The Guide**

The information in the Guide reviews the history and records of environmental activity in Florida, mainly in the 20th century. It lists the variety and types of materials and collections related to Florida’s environmental history, where they are housed, and their accessibility. Records depicting the history of the environment include natural history collections, herbaria, technical reports, data sets, field notes and more.

**Goals of the Project**

a) Consolidate the Florida environmental record;
b) Help uncover hidden collections;
c) Solicit input from archives and libraries throughout the state;
d) Promote to target audiences of students, scientists, historians, and more;
e) Produce an online guide to help facilitate environmental research;
f) Save the planet! (Or at least Florida).

In early 2013 the project was presented at two meetings to solicit input and information from colleagues about their collections. This was done first at the Florida university system’s annual meeting, Florida Virtual Campus (FLVC), held in Sarasota in April 2013, then at the Society of Florida Archivists (SFA) meeting the following month in Tallahassee. The audiences embraced...
the project and were willing to provide information about their collections to be included in the Guide. During this time individuals and various organizations that might have hidden or unprocessed collections were also contacted. Onsite visits were made to many of these libraries and archives to gather pertinent information about their materials.

The Content
The starting point was the development of an Index to steer the project. The Guide was divided into seven sections. The first two parts present the novice researcher with an overview of (1) trends in environmentalism discussing how the ideas of the naturalists, conservationists, and environmentalists differ; and (2) key events in Florida’s environmental history, including the Swamp and Overflowed Land Act of 1850 that pushed for the draining of the Everglades to turn it into viable farmland, the proposed Cross Florida Barge Canal that would cut a waterway path through the state to reduce shipping times, and the dredge-fill projects that threatened coastal ecosystems.

The remaining sections cover the various types of collections: archival and special collections (mainly print); non-government digital collections; local, state and federal government agencies; plants and herbariums; facilities and organizations whose mission is to preserve and protect Florida’s environment; and references and suggested readings.

Entities highlighted consist of a sampling of academic institutions, government agencies, and independent and nonprofit research institutions, as well as individual activists and environmental organizations. Notable collections such as the Reclaiming the Everglades Project in the Everglades Digital Library, lesser known archival collections such as the New College of Florida’s Environmental Studies Program, and the papers of the Archbold Biological Station in Venus, FL (formerly John Roebling’s Red Hill Estate) are included.

Information relating to the papers and materials came from different sources:

- Individuals such as Archie Fairly and Marjorie Harris Carr;
- Organizations such as the Florida Defenders of the Environment and Friends of the Everglades and local chapters of the Sierra Club and the Audubon Society;
- Collections at universities and colleges such as Rollins College Special Collections, University of Miami’s Biscayne Bay materials, and the numerous University of Florida, Smathers Library, Special and Area Studies Collections; and
- Government organizations including federal agencies such as the National Oceanic and Atmospheric Administration (NOAA), and Florida state agencies including the State Archives and the Florida Fish and Wildlife Conservation Commission (FFWC).

Naturalists, Conservationists, Preservationists, Environmentalists
Understanding how the current theory of environmentalism developed starting with its predecessors, the naturalists and conservationists, adds to the knowledge base of the novice researcher. Hence, the first section of the Guide provides an overview of these advocates.
Naturalists in general were a phenomenon of the late 18th and early 19th centuries, as interest in science and exploration exploded in North America, Europe, and Asia. At the time, the prevailing attitude was that nature existed to serve and benefit man, not be preserved or shepherded. Nevertheless, their work paved the way for later ideas.

Naturalists and early conservationists provided descriptions of Florida’s environment and helped shape how later generations viewed and used Florida. Before the establishment of biology, ecology, and similar fields as sciences, the study or observation of the natural world was labeled “natural history.” Virtually anyone who made any study of the natural world, scientifically or as a leisure pursuit, could be called a “naturalist”. William Bartram (1739-1823) is a classic example of this type. Although he lacked any formal scientific training, he traveled through the American South and took extensive notes on the wildlife, plant life, and Native Americans he encountered, which he subsequently published in his 1791 book Travels through North and South Carolina, Georgia, East and West Florida the Cherokee Country, the Extensive Territories of the Muscogulges, or Creek Confederacy, and the Country of the Chactaws; Containing An Account of the Soil and Natural Productions of Those Regions, Together with Observations on the Manners of the Indians.

The later decades of the 19th century and early decades of the 20th century saw the development of many sciences in their modern form and the rise of a new position on humanity’s relationship with the environment. This perspective viewed the environment as a resource to be consumed and exploited, but also to be safeguarded and used intelligently to preserve it for sustainable long-term use.

On the Florida state level there was extensive conservation reform, notably from May Mann Jennings (1872-1963), the First Lady of Florida, who was extremely active and influential in developing state parks and forests throughout the state. She also helped create what is now the Florida Division of Forestry.

Nationally President Theodore Roosevelt (1859-1919) typified the conservation movement. Recognized as an accomplished hunter and outdoorsman, he designated more federally owned land for preservation purposes than all of his collective predecessors. In more recent years William R. Mote (1906-2000), a prominent businessman and avid sport fisherman, served actively on Florida committees and councils for oceanography. He then became a major benefactor of the Cape Haze Marine Laboratory, which subsequently renamed itself Mote Marine Laboratory in honor of the support of Mote and his sister. Mr. Mote’s legacy continues in Mote’s fish stock enhancement and sustainable aquaculture research programs. Roosevelt and Mote were men who had grown to love the environment, and sought to prevent its destruction by wasteful overuse and abuse.

The 20th century saw the arrival of the modern environmental movement following its immediate predecessors, the conservationists and the preservationists. Distinct from conservationists, who emphasized the right to utilize nature’s resources in a sustainable way,
preservationists believed that the environment has intrinsic value and should be preserved unaltered for its own sake, rather than for sustainable exploitation by civilization. These two groups encompass the contemporary environmentalists who respond to environmental destruction, and aim to prevent or halt future destruction basically thorough policies and stewardship.

In Florida, few voices in the environmentalist movement were – or are – so prominent as Marjory Stoneman Douglass (1890-1998), a writer, journalist, and most notably an environmentalist who changed the way the Everglades are seen. Until the mid 20th century, the Everglades was generally viewed as a worthless swamp to be drained and paved. In 1947, the same year that the Everglades National Park was created, Douglass published the book *The Everglades: River of Grass*. This one work, the product of five years of research, radically redefined popular and scientific views of the Everglades and established the area as worth preserving in its own right.

**Archival Collection Records: Background and Examples**
The largest section of the Guide covers the Archives and Special Collections throughout central and southwest Florida. This section provides information on many of the hidden or unprocessed materials encountered during the project. Two of those collections are highlighted here, including their associated Guide record.

**The Environmental Studies Program Collection Background**
This New College of Florida Archives collection offers significant resources for researchers, although most of the contents of the collection have received minimal processing and description. An online collection description or finding aid exists and the collection record is accessible via a search in WorldCat. The collection was selected for this project because it is fairly hidden and demonstrates a significant history of innovative work and interdisciplinary relationships, an integral facet of the College, which has historically offered students undergraduate research opportunities and could provide insight to future researchers. The documents also provide evidence of early collaborations in the scientific community with several other research organizations including Mote Marine Laboratory. The Map series has received some initial organization although it is in need of refinement, updating and greater accessibility. The collection overall has minimal content digitized so both internal and external researchers could benefit from additional surface exposure and outreach from this Guide.

**Record**
**Collection Title:** Environmental Studies Program Collection, 1972-2013
**Library/Archive:** Jane Bankroft Cook Library at New College of Florida, Sarasota, FL.
**Volume/Storage Container:** 48 linear feet
**Description of Material:** Correspondence, literary production, printed material, financial documents, photographic materials, an extensive map collection, and subject files for associated programs and activities. Some materials digitized.
Abstract: The Environmental Studies Program Collection is a synthetic collection documenting the history of the academic program, which initially focused on environmental science research under the direction of the notable New College faculty member, John Morrill and has since transcended into becoming a far more interdisciplinary program. Early records include the description by John D. MacDonald regarding the proposed program, the potential challenges and benefits, and his insightful vision for the program. The materials, such as the Environmental Studies Program First Decade publication and other annual reports reflect the evolution of the program, the influence of several directors, the program administration, student research projects, seminars, courses, lectures, conferences, and opportunities for off-campus, graduate research, and employment. Records in the collection provide evidence of student field work in the Southwest Florida Region, group research, experience writing proposals, as well as, the support of a network of cooperative researchers and professionals. The Program materials, also, document the environmental study needs of the community, including the early records of the Citizens Advisory Committee. The repository at the Carriage House offers an extensive and unusual map collection, and related subject files and materials reflecting the significant work of the program participants and a robust level of research activity.


Breder Collection Background
Dr. Charles M. Breder Jr. (1897-1983) was an experimental and behavioral ichthyologist with a specific interest in the study of flying fish and fish sounds. His hand-written field journals and photographs depict zoological research in Florida, the Caribbean, Mexico and New York from the 1920s through the early 1970s. His meticulous field notes are an invaluable source of scientific information and social commentary of the time. His pioneering fish research helped draw attention to the west coast of Florida. Dr. Breder worked at various facilities during his lifetime including the New York Aquarium, the American Museum of Natural History and the Lerner Marine Laboratory in Bimini, Bahamas. He was the mentor and long-time friend of Mote’s founder, Dr. Eugenie Clark, who is known world-wide as the “Shark Lady.” He also served as interim director of Mote Marine Laboratory in 1967 and spent many years as research associate in residence and member of the board of directors at Mote.

His collection of field journals, illustrations, photographs, slides and other materials were donated to Mote Marine Laboratory in 1984 by his wife, Phyllis. The materials remained in storage until the launch of Mote Library’s 2009 archives basic processing grant. Currently, the majority of the collection has been processed, a finding aid created, a collection record added to Archon (an archives descriptive management system), and numerous field journals transcribed.

Record
Library/Archive: Arthur Vining Davis Library and Archive at Mote Marine Laboratory, Sarasota, FL.
Volume/Storage Container: 18 linear feet
Description of Material: 21 field journals, field notes, correspondence, illustrations. Finding Aid available. Some materials digitized.
Abstract: Dr. Breder (1897-1983) was an experimental and behavioral ichthyologist whose work and achievements dominated the field. During his lifetime he wrote 160 papers and books. Covering thousands of pages he recorded an unparalleled array of field and laboratory investigations, and systematic and distributional studies. Many of his field trips and expeditions for the New York Zoological Society, the American Museum of Natural History and the New York Aquarium involved research in Florida and the Caribbean. The contents of his field journals include notes, itineraries, illustrations, and observations from specific scientific expeditions and laboratory research. They also provide an insight into the early meticulous scientific thoughts of this biologist, and how he examined and developed ideas.
Notes: An ichthyologist is a zoologist who studies fishes.
URL: https://dspace.mote.org/dspace/handle/2075/2907

The Guide has been added to the Mote Library open access repository. It is available at https://dspace.mote.org/dspace/

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us to visit their facilities to explore their archival collections. We thank The Arthur Vining Davis Foundations and the Henry E. and Pauline S. Becker Foundation for their support.

References


Links
Mote Library http://www.mote.org/library
Mote Repository https://dspace.mote.org/dspace/
New College Library http://www.ncf.edu/library
New College Repository http://ncf.sobek.ufl.edu/
DOLPHIN SPONSOR PRESENTATION

COPYRIGHT VS. OPEN ACCESS: WHAT IS THE FUTURE OF SCIENCE PUBLISHING? *

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Abstract:
From its beginnings, copyright has been an instrument to disenfranchise the authors of published texts. In the 16th and 17th centuries, copyright regulations were used to exercise censorship, and in the 19th and 20th centuries, copyright was introduced across the globe for the purpose of protecting the interests of publishers and of authors' employers. In the 19th century, copyright was limited to periods of a few decades, to secure long-term accessibility to information for the public domain; in recent years, however, the duration of copyright has been extended considerably. Together with high-price policies (for subscriptions and other services) of most science publishers in the second half of the 20th century, this has severely curtailed access to primary scientific information, prompting the development of an Open Access (OA) movement. Modern information technology — with or without OA — is converting publishers' efforts to make copyright more restrictive into a fight against windmills: The restrictions cannot be enforced effectively, and the demise of copyright in science publishing appears unavoidable. Current developments will probably provide universal access to research results; at the same time, however, they may force quality-oriented commercial publishers into sacrificing accuracy and reliability of publications in order to remain competitive, thus compromising scientific communication as a whole.

Keywords: Communication; authorship; writing; publishing; scientific journals; copyright; Open Access; public domain.

1. History
There is a persistent myth that copyright is designed to safeguard an author's economic ownership of the work that s/he has created (e.g. CSE 2006, p. 21: “The economic rights enable the creators to control the reproduction, performance, and broadcast of their intellectual property”). In reality, the purpose of copyright regulations since their inception in the 16th
The 19th century has been to exercise censorship and to protect the interests of publishers and of the authors' employers. Copyright legislation does ensure authors' perpetual moral right to be identified as creators of the works, but it does not protect their economic rights.

The publishing industry was born in Europe in the 15th century, when mechanized printing made mass production of literature possible and profitable. In the mid-16th century, the Charter of the Stationers' Company in England gave publishers monopolistic control over printed works, initially for the purpose of suppressing writings advocating Protestantism — and after Protestants gained power, for the suppression of Catholic writings (Crosskey & Jeffrey 1953).

Censorship was eroded at the beginning of the Age of Enlightenment. Publisher copyright was abolished in England in 1694, thus creating "a public domain for literature" (Patterson 1993, p. 11). To regain control over the printed word, British publishers initiated a campaign in the early 18th century, advocating that authors had a "natural law" right to the works they created — and that this right could be transferred to the publisher, in payment for the publisher's services.

The "natural law" postulate laid the groundwork for restoring the publishers' monopoly in Britain (Patterson 1993), a practice that spread internationally during the 19th century. In most countries, however, there was concern over the vitiation of the public domain, i.e. the obstruction of access to publications. Germany's rise as an economic power during the 19th century, for instance, is attributed in part to the absence of copyright restrictions, which facilitated an "explosion of knowledge" (Höffner 2010).

To promote the dissemination of information over the long term, copyright was limited to periods of a few decades; this was formalized internationally in the Berne Convention of 1886 (WIPO undated). Intellectual property law has evolved further, however, undermining the public domain. Today, copyright duration has been extended to a century or more in some countries (see also http://en.wikipedia.org/wiki/Public_domain), and the copyright in many (if not most) countries is granted by law to the author's employer (in the USA the employer is often considered to be the author: CSE 2006, p. 23–29).

2. "Natural Law" vs. Public Domain
The central issue in the copyright debate is: Who should "own" the information — the creator (or copyright holder), or the user (i.e. the community at large)? This has been the subject of extensive litigation, for instance in the entertainment industry. Courts of law more often than not side with copyright owners, on the basis of the "natural law" postulate (e.g. Kalven 1967, and references therein).

A majority of theorists, however, give the public domain primacy over the authors' rights, and consider the "natural law" argument to be an artificial construct (e.g. Patterson 1993; see also: http://en.wikipedia.org/wiki/Natural_law). Without unfettered access to all published information, education and progress would be constrained, since all publications are founded upon previously published information — every author is primarily a reader before s/he
becomes a writer. In science, the issue is complicated by the fact that most research is publicly funded, but privately published.

The dichotomy between the "natural law" and "public domain" postulates manifests itself in the copyright asserted for works authored by government employees under the British Crown (UK, Canada, Australia and New Zealand) on one hand, and in the USA on the other. Whereas Crown copyright cannot be transferred to another party, the USA asserts that the work of a government employee is in the public domain. As the Crown retains copyright, it can reproduce and distribute (or limit distribution of) scientific articles, i.e. the Crown forces publishers to provide a free publishing service to the government, and thus obtains free Open Access (OA) through the back door. The public domain aspect for work created by employees of the US government entails a similar free service (CSE 2006, p. 26, 29).

Publishers invest about 2000 € for every published article (costs for the review process, production of accepted papers, maintenance of online services, etc.). Manuscripts that are rejected entail a financial loss. Who reimburses the publisher? If we follow the "natural law" argument, then the public should pay for access to published information — as is usually the case today in the form of library subscriptions; if the public domain is regarded as having priority, however, then access should be free, and authors or their institutions should cover the publication costs — this is represented by the Open Access (OA) option that is becoming increasingly popular.

The issue may be moot in wealthy societies where scientific institutions have the resources to pay for either the publication of papers or for journal subscriptions. Poorly funded institutions, however, e.g. in developing countries, may be excluded from access to information, because they lack the money to subscribe to scientific journals. Switching from a "reader pays" to an "author pays" model would give scientists everywhere access to all published information; those with lack of funds might be limited in their ability to publish in expensive primary journals, but they would still have possibilities to publish online, with worldwide visibility, in outlets that are free of charge; additionally, some OA publishers waive the fees for authors who cannot pay. Moreover, publication costs can be funded by the authors' institutions, or included in research budgets, where they constitute a minor item.

3. Commercial Interests
Scientific publishing traditionally had little commercial purpose, being directed at a small, specialized market. Until the mid-20th century, most scientific publishing was undertaken by scientific societies, universities, or small academic publishers, which historically published without paying royalties or reviewers, and publications were funded from membership fees, journal subscriptions, and university or government budgets (e.g. Balaban 1978). From the mid-20th century, technological advancements in printing required considerable investment. At the same time, the increasing number of publishable studies, and the view that being a publisher is not a core task of public institutions, meant that government agencies, universities, and societies increasingly handed over publishing to commercial entities. Over the
past 50 years, scientific publishing has become a big business and corporate publishers have bought up nearly all scientific journals (see e.g. http://en.wikipedia.org/wiki/Academic_publishing#Publishers_and_business_aspects).

As commercial profits became the driving force, journal prices skyrocketed; e.g. from 1977 to 1990, the average subscription fee per journal quadrupled (Young & Hammell Carpenter 1990, their Table VII). Since the 1980s, library budgets have been limited, and large corporate publishers sought to wring more money out of their publications by toughening their attitudes with regard to copyright and reproduction of scientific information; e.g. a review article published a few years ago by an Inter-Research (IR) journal cost the author hundreds of Euros for permission to reproduce figures from other papers. The high-price policies of the major publishers have long been an impediment to scientific information exchange.

In various countries, copyright clearance agencies issue licenses and collect fees on behalf of publishers and authors. The right to act as an agent for the publisher is assumed under powers issued by copyright tribunals, international agreements, or publisher associations presumed to act for members and non-members alike. Thus, publishers may be unaware of the agencies that act on their behalf, of the licenses that they issue, and the fees that they collect.

The fee collected by a clearance agency — though termed the "publishers' copyright fee" — is not paid out to the publisher. Internationally, a portion of the fee is transferred to the licensing agency in the publisher’s country (e.g. for Germany, VG Wort). The onus is on the publisher to register with the agency, submit various financial and publishing details, and (up to 18 months later) receive a payout the agency calculates to be a fair share; the payout calculation itself is not transparent. Before the advent of online publication, IR participated in the US Copyright Clearance Centre (CCC) scheme; after the CCC subtracted its fees, the amounts received were so small (cents) that IR did not bother cashing the checks.

In the 17th century, censored works were often published abroad (Amsterdam made a lively business of this; Shorto 2013). In the 21st century, Amsterdam is everywhere — on the Internet. Copyright issues are more fluid than ever before, as modern information technology (IT) makes it possible to copy and disseminate publications worldwide at negligible cost. While copyright regulations are becoming more restrictive, and works are transferred from the public domain back into private ownership (e.g. Liptak 2011, LAT 2012), it is also becoming impossible to enforce the copyright — a problem for the entertainment industry, where pirated material may have great commercial value (cf. MacKinnon 2011, NYT 2011).

Commercial publishers need a reasonable income guarantee, following the "natural law" postulate, in order to exist. Submitting a manuscript to a journal for eventual publication is contracting a service, but it is perfectly possible for an article to be published at no expense to the authors. Traditionally, cost recovery has been guaranteed by copyright transfer and covered by the sale of the article to subscribers; these, however, bear more than their share of the cost when non-subscribers obtain the same articles for free (the "shoplifting effect").
distribution and “green” OA (see below) — as well as reductions in library budgets — cause a decline in subscriptions and reduce the economic viability of the present model of science publishing.

4. Open Access (OA) and the Future Of Science Publishing
The Open Access (OA) movement has gained force since the 1990s in reaction to the diminished accessibility of primary literature that resulted from publishers’ high-price policies. There is a variety of OA models (see e.g. http://creativecommons.org/licenses/), and we focus on 2 broad categories: (1) "Green" OA, by which the authors make their manuscript freely available on the World Wide Web, either through a personal website or via an institutional repository. (2) "Gold" OA, by which the publisher makes the journal article freely available, after copy editing and typesetting, usually for a fee.

Computer software and the worldwide web have made it easy to produce and distribute literature. Publishing is not necessarily cheaper, however, as often thought by people who do not see the costs of the hardware, utilities, license fees, third-party services etc. that lie behind the IT delivered to their desktops. It has also facilitated the rise of new publishing enterprises that specialize in the production of OA journals.

Government and academic institutions originally installed IT infrastructure for functions other than publishing, but this also enables them to wrest control of the production and dissemination of scientific literature back from the commercial publishers, e.g. by requiring "green" OA for accepted papers authored by their employees (cf. Dawson 2013, Sutton 2013), a practice that is increasingly common in the USA, and that we expect will spread farther.

Publishers acknowledge that the OA movement has caught them by surprise (see http://www.stm-assoc.org/events/frankfurt-conference-2013/). "Green" OA repositories may be ethically desirable, but they undermine the subscription-based system by taking a value-added service provided by the publisher (e.g. organization of the peer review process), and then dodging the bill for it. Moreover, "green" OA is based on the faulty assumption that the accepted manuscript is error-free and ready for distribution — i.e. that copy-editing and typesetting add little but tidiness and style.

Peer review, however, does not guarantee a scientifically accurate report. For instance, 221 reviewers of a trial manuscript spiked with 8 flaws found on average only two of these errors (Godlee et. al 1998). Among >300 OA journals to which a Science reporter submitted a spoof manuscript, only in 36 did the referees recognize any of the grave scientific mistakes that had been introduced, and 16 of the journals accepted the manuscript for publication without requiring revision, despite damning reviews (Bohannon 2013). Jefferson et al. (2008) evaluated 28 studies on the review process and concluded that peer review alone cannot ensure the quality of research papers. With review by two referees, as used by most journals, as many as half of all accepted manuscripts can be flawed, while with pre-screening by the editorial board
and review by 3–4 referees (the system employed by IR), probably one-fourth of all manuscripts remain flawed at the time of acceptance (e.g. Neff & Olden 2006).

The present situation was foreseen by Kinne (1999, p. 1): "[T]he Internet is a giant with a powerful body but without a head (…) electronic publishing can not only trim the publication process, it can also make it cheaper. All this is good for science and may increase the competition between publishers — a desirable feature for correcting overrated publication costs (…) At present we can neither fully assess the extent of the resulting changes nor their consequences. With respect to science, three things are certain, however: (1) There will be no principal changes in the ways knowledge is created, quality-controlled and utilized by researchers. (2) There will be significant changes in the ways scientists communicate with each other, in which research results are presented, and in which knowledge is analyzed, disseminated, and digested. (3) There will be risks that endanger science as we know it today."

The presentation of research results may be undergoing a paradigm shift. Kinne (1999, p 3) concluded that "As yet insufficiently tapped possibilities for reducing publication cost lie in cutting down on wordiness and jargon". Recently, a major publisher suggested that science publishing could be reduced to producing a single page of abstract, key points, key references, and a couple of figures and marketed through apps on smartphones or tablets (presumably with the full dataset accessible upon request, or in an OA repository), on the grounds that people do not want to read much anymore (E. Kittel-Prejs, Int Symp Ecohydrol Biotechnol Eng, Sep 17, 2013, Lodz, Poland; after B. Moss, pers. comm.).

5. Where Does This Leave High-Quality Publishers Such As Inter-Research (IR)?
At IR, copy-editors and proofreaders do much more than correct grammatical and spelling mistakes — detailed quality control is by far the greatest expenditure. Contradictions between data in figures and text, tables that obfuscate data rather than present them simply, illegible graphs, contradictions between methods and results are often found during production, and they sometimes require extensive correspondence with the authors.

There is a possibility that future researchers will consult only the "green" OA version, and never cross-check this with the version of record (the final, published version), especially when the latter is locked behind a subscription barrier. The solution to this, according to OA enthusiasts, is to force publishers to permit authors to deposit the final published versions of all papers in a "gold" OA repository. Whether "green" or "gold", however, OA eliminates sales revenue protection. If subscriptions continue to fall, publishers will have to shift toward pre-payment for publication (a return to the system that predated the 16th century), e.g. via manuscript submission fees, page charges and OA fees.

In the next 2–3 years, IR will probably convert its newest journals, which have the lowest subscription figures, to fully author-funded OA. This entails another risk, however. As long as funding of journals/publishers occurs via the libraries, we can expect that professional decisions will be taken to subscribe to the best journals, generally those with more thorough review and
production processes. If the authors — who are under constant pressure to publish much, fast, and (maybe) cheaply — disburse the funds, they could favor publishing in the easiest and most inexpensive OA journals, even if these have a faulty review process that sometimes looks more like an unmoderated web blog — authors might even welcome the opportunity to liberate themselves from the "tyranny" of strict academic review.

Will science publishing descend into intellectual anarchy? Will publishers that invest heavily in quality control be able to compete with "cheap" OA providers that forego strict peer review, as well as copy editing and typesetting, i.e. producing what is almost "grey" literature and providing no more service than any "green" OA repository? This is yet unknown; the work that e.g. IR invests into any manuscript is often insufficiently appreciated by users, and sometimes even resented by authors.

We think that quality in science publishing is already threatened (cf. Seaman 2011), and the OA movement — particularly in the form of "green" OA — will further reduce the accuracy and reliability of scientific communication. The next years will be challenging for a quality-oriented publisher like IR. With respect to the theme of the 2013 IAMSLIC conference, the future will be bright only if "green" OA and cheap mass-production of articles that have barely been quality-controlled do not displace high-quality publishing and "gold" OA.

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PANEL: THRIVING AFTER SURVIVING LIBRARY CONSOLIDATIONS

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Abstract:
In response to budgetary realities and enabled by the growth of online collections, there is a trend in academic institutions to consolidate branch libraries. Library consolidation is challenging but can present new opportunities. As academic librarians closely involved in the changes at our three institutions, we reflect on our experiences and share the challenges we faced, lessons learned, and successful outcomes. In this paper we describe the restructuring at three large academic libraries on the west coast of North America that resulted in library consolidations, new service models and reconfigured spaces to meet changing user needs. Library consolidation is challenging but can present new opportunities. As academic librarians closely involved in the changes at our three institutions, we reflect on our experiences and share the challenges we faced, lessons learned, and successful outcomes.

Keywords: academic libraries, library consolidation, service models, user space

Part One: Woodward Library, University of British Columbia, Vancouver
Sally Taylor

Introduction
In 2012-2013, the University of British Columbia consolidated the Science & Engineering branch library and two off campus hospital libraries into the existing Woodward Library, integrating not only collections and services but also separate teams.
Background
When I started working at the University of British Columbia (UBC) in 1997, the Woodward Biomedical Library, as it was called then, served the biological sciences and all the health disciplines. Now, 16 years later, it is the Woodward Library, and we are THE science library on campus, serving all STEM (Science, Technology, Engineering, Medicine) disciplines.

Library consolidations at UBC are certainly not unique in Canada. At the same time that the Science & Engineering library division in the Irving K. Barber Learning Centre merged with Woodward Library, the Life Sciences Library at McGill University in Montreal merged with the Schulich Library of Science and Engineering, and not without protest from staff and users. This year we also witnessed the closure of many federal government libraries. Of interest to IAMSLIC was the consolidation of 11 libraries at Fisheries and Oceans Canada into four. Library services will be offered at two primary locations, the Institution of Ocean Sciences in Sidney, British Columbia and the Bedford Institute of Oceanography in Dartmouth, Nova Scotia. In addition, there will be two specialized collections at the Canadian Coast Guard College in Sydney, Nova Scotia and the Canadian Coast Guard Technical Library in Ottawa (Fisheries and Oceans Canada 2013).

History of Library Consolidations at UBC
At UBC, the consolidation of the science libraries began in 2007 with the closure of two libraries (Figure 1). The Math Library closed, and the collection was transferred to the Irving K. Barber Learning Centre (IKBLC). The MacMillan Library also closed, and its collection was split between Woodward Library (forestry and agriculture) and IKBLC (wood science).

![Diagram of library consolidations in 2007](image)

*Figure 5. Collection moves in 2007 as a result of the closure of Math and MacMillan libraries.*
In 2009/2010, the Library Processing Centre, which housed the library’s Technical Services and Systems groups, was identified by the University as space for a new School of Population & Public Health. As a result, Technical Services staff moved into half of the top floor of Woodward Library, necessitating a large collections move (Figure 2). At the same time, we took the opportunity to clear out compact shelving in the basement that was constantly broken. The solution was to move the collections to “Remote Storage,” temporary warehouse space in Surrey, a Vancouver suburb about 1.5 hours drive from campus. The material would be inaccessible for four years until a permanent storage location was built. With this in mind, we decided to move print journals that were available online. The University gave the Library onetime funding to purchase back files for 800 journal titles, enabling us to move a total of 1400 journal titles. To reach our goal, we also moved 38,000 older, low-use monographs temporarily to the Koerner Library and then eventually into the Automated Storage & Retrieval System (ASRS) in IKBLC.

![Diagram showing collection moves in 2009/2010](image)

*Figure 6. Collection moves in 2009/2010 as a result of technical services moving into Woodward Library.*

At a Town Hall in May 2012, the University Librarian announced that there would be a number of changes in the Library. These changes were implemented over the next 16 months. The closure of the Music Library and consolidation with the Art, Architecture & Planning library division in IKBLC precipitated the move of Science & Engineering into Woodward Library. The President’s Office moved into the top two floors of Koerner Library (Humanities & Social Sciences), and the small business library at Robson Square, UBC’s downtown campus, closed. Perhaps the most shocking news at the Town Hall was the possible closure of two of the three libraries located off campus at the affiliated UBC Teaching Hospitals. After almost a year of uncertainty, the Library made the decision to close the Hamber Library at the Children’s & Women’s Health Centre of British Columbia and the St. Paul’s Hospital Library, and to offer library services to these user groups remotely. In the final tally, the Library moved almost 1 million items (Figure 3).
The move to accommodate the integration of collections from Science & Engineering and the two hospital libraries into Woodward Library was complicated. Not only were we moving collections between buildings, we were also dealing with multiple sub-locations within buildings such as course reserve, reference, current journals, stacks and storage (Figure 4). We ended up moving 90,000 items to the ASRS and more than 200 journal titles to Remote Storage in Surrey. At every stage, we weeded low use duplicates, which was a huge project for the hospital collections and is still ongoing.

Figure 8. Rough diagram showing collection moves between several locations and sub-locations.
What Worked Well?
Despite the scope and ambitious timeline, the most recent collection moves were successful due to a number of factors, most notably ones related to the overall management. The project was well supported by the Collection Management and Planning (CMP) Librarian in Technical Services and a Collections Management Coordinator who was hired specifically to manage the moves. In addition to the 50 staff involved across the system, the Library hired a team of 20 students who were well trained to move books, measure shelving and change records. Given the widespread impact of the move, a Collections Move Management Team (CMMT) was established with representatives from the affected branches as well as units that were critical to the success of the move, namely Borrower Services, Technical Services, Library Systems & Information Technology and the ASRS. Initially meetings were held weekly for planning and discussions, tapering off as specific moves were completed. Given the pace of change, the Coordinator and the CMP Librarian released weekly communiqués in the staff bulletin to provide specific details on the moves to all librarians and staff.

In addition to overall management, elements relating to data integrity and technology contributed to the quality and efficiency of the project. Prior to the collection moves, inventories were done in almost all library branches to identify missing items and fix records, which meant we started the collections analysis with reliable data. We used Voyager reports to make decisions for weeding duplicate copies as well as for moving unique titles into storage based on publication year and circulation statistics. The CMP Librarian and Coordinator learned to massage the Voyager data to make the reports more useful. For example, they added a sortable call number column and a “Likely Publication Year” which strips out the copyright symbol and other date variations making it easier to filter and sort. One seemingly minor change in technology since the last collection move but which made an enormous difference for the analysis was the upgrade to MS Office 2010 which has a feature in MS Excel to sort and filter by colour. In deciding which journals to move to the Remote Location, I called in the assistance of our licensing specialist who checked each title for post-cancellation rights or perpetual access, something I had failed to do in the previous move which had led to a few titles being inaccessible. Library Systems & Information Technology developed an in-house program called iMove to permit students or staff to quickly and easily change the location of an item. Errors are logged into a report that can be accessed by the Coordinator for later clean-up by Technical Services staff. The move went extremely well, but of course there will still be errors in the records. Instead of living with them as we have in the past, the Library has embarked on a data clean-up project in preparation for yet another move to a permanent storage facility on campus that will be constructed by 2015.

Benefits
The collection moves for Woodward Library has had some positive outcomes. By moving out more materials than we took in, we were able to create additional study space to accommodate the increase in the number of students who we now serve, as well as to create room for growth in the collection. We were able to retain a logical call number split between floors so that the second floor houses the science and engineering collections, and the third floor is mainly health-related. Journal runs that were split between Hamber and St. Paul’s Hospital libraries and
Woodward Library have been reunited. The Current Journals section where unbound journals had been arranged alphabetically by title was re-organized by call number. Despite the transition to online journals in recent years, we still have approximately 400 print journal subscriptions, so we are pleased that the titles are now organized by subject and parallel the arrangement of their bound counterparts in the stacks. During every collection move, staff de-duplicated low use monographs. In the case of the hospital collections, these books can be quite recent, and we offered them first to students on a “book sale” truck that raises a small amount of funds for Woodward Library. The majority of books were discarded, a difficult task for librarians and staff but one that has been made easier now that the Library has an arrangement with Better World Books (BWB). BWB is a program in Canada, the United States and the United Kingdom that accepts and sells used books. BWB pays shipping costs, and gives a small percentage to the UBC Library and to a literacy program.

Challenges
Despite the successes, it was a challenging year. Although we were forewarned that the two hospital libraries might close, when a final decision was made, the news still came as a shock and was quite difficult on staff, a few of whom had worked there for many years. The actual move of the hospital library collections went smoothly. Librarians and staff at the two locations had prepared in advance by weeding the collection, sending older monographs to the ASRS, and preparing unbound journals for binding, which were then pushed through by Technical Services. It was a short timeline but the CMP Librarian and Coordinator had factored it into the planning. Outside movers were hired, and it all happened within three weeks of the announcement. We were fortunate to have swing space on the main floor of Woodward Library, so both hospital library collections were moved there, and we could decide on the final destination and de-duplicate materials during the summer and fall. While most of the collection remained at Woodward, some very current items were transferred to the Biomedical Branch Library at Vancouver General Hospital, the remaining off-campus hospital library.

Integration of the People
This paper has focused on the integration of collections but of course library closures and consolidations mean that people are moving too. My former boss (who was Acting Head of Woodward Library) and my new boss (who was Head of Science & Engineering and now Acting Head of Woodward Library) worked hard on the integration of the librarians and staff, and the work that we do. We had an initial meeting of just the librarians where we made a long list of our client groups, which enabled us to focus on the users and clearly see areas of overlap. I was always aware that we shared interdisciplinary areas such as biomedical engineering or oceanography but recently I’ve encountered new examples such as wood science and drug delivery. Coming out of the first meeting, we established three working groups of librarians and staff, each one focused on a different area: public services, teaching & learning, and collections. These groups made recommendations on how best to integrate our practices, and presented these recommendations at a one-day facilitated meeting where we created a roadmap and timeline to achieve our goals. For example, the collections group recommended merging funds and creating a three-person collections management team with each person taking a lead on a
resource type (monographs, serials, databases) versus dividing the pie by discipline, which would not be an integrated approach.

Since the Science & Engineering librarians moved into Woodward in December 2012 and the hospital librarians in April 2013, colleagues from different branches have had opportunities to work together. The approach we took for collections management is working extremely well; we each bring a depth of experience to the team, and although we have defined roles, we can back each other up if one person is away. We have juggled a few liaison areas; for example, I have taken wood science back under the fold of forestry, and my colleague who liaises with civil engineering has taken on public health, two areas that often overlap. We have a small team of Student Librarians who are now jointly managed by a Woodward librarian and the librarian who was formerly at Hamber Library. Next term I will be co-teaching a library school course with the liaison librarian for mathematics, computer science and engineering. Although we planned this a couple of years ago, it is easier to prepare for the course now that we are in the same building. Finally, this same librarian has teamed up with the pharmacy librarian to participate in the organization of the first western Canadian science boot camp. Some of us already had established working relationships with our colleagues in other branches, but since we are now together in one space, it is easier to combine forces to deliver better library services to our users.
Part Two. The Library, University of California, San Diego
Amy Butros

Introduction
In 2012, the University of California, San Diego consolidated the Scripps Institution of Oceanography Library into the Geisel Library and the Science & Engineering Library. Scripps Library was the fourth library to be consolidated/closed in 2011-2012. In summer 2013 the last four branch and discipline libraries of the original nine were consolidated, leaving only one library in two buildings. A complete restructuring of the Library’s departments and programs was implemented in 2012-2013, resulting in a new organizational structure, consolidated collections and services, and different jobs and reporting lines for most staff.

Background
I began working at the Scripps Institution of Oceanography Library in 2003 as their new Instruction & Outreach coordinator. At that time I had no idea that this library, one of the oldest and largest oceanographic libraries in the world, would close before I retired.

In 2003, and up through 2011, the UC San Diego Library system had 9 libraries:
- The Geisel Library Building housed:
  - Arts & Architecture Library
  - Social Sciences & Humanities Library
  - Science & Engineering Library
  - Mandeville Special Collections
- Biomedical Library
- Medical Center Library
- CLICS (infocommons & undergraduate library)
- International Relations & Pacific Studies Library
- Scripps Institution of Oceanography Library

The first branch library to close was the Medical Center Library in spring 2011, then the CLICS “infocommons” and the International Relations & Pacific Studies Library closed in summer 2011. In June 2012, the Scripps Institution of Oceanography Library (founded in 1912) closed, and the rest of the discipline based branch libraries were all consolidated into “The Library” by summer 2013.

Preceding the closures and consolidations were many Town Hall meetings with detailed explanations of our budget situation during which we were told of the closure plans and the timeline for the closures. What helped staff morale was administration’s promise that layoffs would be avoided, and building closures and consolidations were necessary to keep jobs and collections from being impacted too severely.

The anticipated additional cut of $3-$6 million to the Library’s budget solidified the closure plans. Library administration and planning teams conducted several retreats, planning sessions, and focus groups, resulting in the Library’s reorganization taking shape.
Current Situation
My current job allows me to work as an “Embedded Librarian,” working several days a week out of an office that is located in a Scripps Institution of Oceanography building, not a Library building. This is a great advantage because I am available onsite to the Scripps community for instruction, consultations, and reference. Faculty and graduate students do drop in to consult with me, which is more convenient for them than traveling around 2 miles to visit our Library on the main campus. My Scripps office is in the Scripps Administration Building, very close to the Scripps space that is used for book pickup & drop off, print course reserves, and graduate student study/collaboration space, which is very convenient if the graduate students have any questions or need help with collection paging, etc. To plan and implement the remote services of collection paging, course reserves, and location furnishing, I worked closely over a period of several months with the Scripps Graduate Office Manager and key Scripps administrative staff, and then I presented proposals to Library administration for approval of these remote services, which were implemented in July 2012.

Figure 5. Embedded librarian office in Scripps Administration Building.

Collection Consolidation
Moving the massive Scripps collection, close to 164,000 items, took a little over one year to accomplish. We needed to vacate the first two floors of the former library building so Scripps departments could renovate and occupy the vacated space. My first weeding project at the start of the Scripps collection moves was the reference collection. I selected fewer than 1/3rd of the reference titles for the move to the Science & Engineering reference collection (now integrated into a general reference collection in the Geisel Library); these were mainly items for undergraduate use. Titles that would be of more interest to Scripps researchers and graduate students I transferred to the circulating collection so that they could be paged down to Scripps when requested. In addition, print copies of online reference titles (encyclopedias and handbooks) were removed to the circulating collection. By summer 2013, a year after the library
closed, the books and journals’ move to compact shelving in the Geisel Library building was completed. I am now involved in weeding projects for Scripps media titles (old CD ROMs), and special collection titles, with more weeding projects planned for the coming year.

![Image of compact shelving in Geisel Library]

*Figure 6. Scripps Library collection moved to compact shelving in Geisel Library.*

**Staff Reassignments and Reporting Lines**

We were very fortunate that our Library administrators did not initiate any librarian or staff layoffs. Staffing levels were carefully planned and communicated to staff at the initial restructuring planning stages, a fact that helped improve morale considerably. After retirements and staff attrition, there were enough positions for all the remaining staff after the library closures and consolidations.

The campus budget is looking better now, and hopefully savings from closures and consolidations will help us in the future. We have been able to start some recruiting for vacancies and new positions.

Our new structure is now promoted as One Library in four locations: two library buildings, Geisel Library Building and Biomedical Library Building; a storage Annex five miles east of campus; and the one floor left from the Scripps Library building known as the “Scripps Archives and Special Collections Annex,” where unique collections such as the institution’s historical archives and some atlases and expedition reports are housed. In this new structure we have three Associate University Librarians (AULs) supporting our University Librarian, when we previously had five. Each AUL has several programs reporting to them, with new “Program Directors” managing each area. Many of these program directors were hired after internal recruitment, and they are
managing new, and renamed, areas such as Academic Liaison Program, Learning Services, Learning Spaces, Digital User Services, Reference & Research Advisory Services, Collection Development & Management, Digital Library Development, Metadata Services, Research Data Curation, Information Technology Services, Internal Communication, etc.

This new structure is very complex, and in many cases one person can be in three or more programs. To assist with management and reporting lines it was decided that each librarian and staff member have one “home” program, the program where they have been assigned at 50% or more. So, for example, a librarian could be assigned 60% in the Academic Liaison Program, 25% in Collection Development & Management, and 15% in Reference & Research Advisory Services.

Challenges
Initially adapting and “thriving” was simpler in summer 2012, when only a few libraries closed and the remaining libraries absorbed the staff and collections. In that year, the collections and services from the initial four libraries that closed were consolidated into the remaining libraries. This was accomplished with key staff from each library leading “closure projects” and monitoring collections, staff moves, equipment, furniture, etc., and then the relocated staff took on similar duties in the remaining library branches.

For example, the Scripps Institution of Oceanography liaison librarian, responsible for instruction, outreach, and reference, continued these duties for Scripps patrons while based in the Science & Engineering Library. In summer 2013, the closure of all discipline based libraries created bigger challenges, with the total restructuring of staff jobs and the creation of new “programs,” reporting lines, and service models. The plans and new structure, conceived, vetted, and streamlined over a period of almost three years, was put in place by the end of summer 2013. It was mainly in July and August 2013 that the Library’s new program structure, librarian and staff re-assignments, and reporting lines were finalized. Most recently, in fall 2013, is when all physical moves are being implemented and they should be completed by the end of the year.

It has been a major challenge to maintain our level of service in some “standard” areas such as reference, instruction, circulation, Interlibrary loan, collection development & management, etc. while staff are being moved, trained, or taking on more/new roles due to consolidated jobs or long term vacancies. It is true that our previous practice of not having any new hires for three years brought about major salary savings, but the added workload created additional stress on the remaining staff. With the new structure we have many librarians and library staff in more than one “program,” some are in three or four different program areas and they will need time to adjust to this new structure and their new reporting lines, and to figure out the process for support systems (e.g. access to administrative assistants, technical support, and student employee help).
Are We Thriving?
It is too soon to tell if our staff, programs and new structure are really “thriving” since we just started implementation in summer 2013 and our Library administration is allowing us one year of “shake out” time. After the year is over we can evaluate, revisit, and rework any areas or programs that appear to need it.

What is going to be difficult for us is to learn how to work and coordinate our areas of overlap; for example, librarians whose home program is in collection development but who are the subject specialists for their topic and are called upon to do instruction and reference by other programs they do not report to. How can we evaluate these programs, services and people, with so much overlap and with different “percentages” for people in each program?

At this point, some of our staff see these new areas as exciting new opportunities for growth, development, and learning new areas to be able to offer new services, such as the chance to be closer to our users by offering office hours and reference/instruction opportunities in their departments. There are also opportunities to explore new service models and ways to use and implement new technologies, especially in the arena of online instruction. So I remain optimistic, very tired after all the changes and office moves, but hopeful of what the future may bring.
Maureen Nolan

Introduction
In 2009 the University of Washington consolidated three science branch libraries (Natural Sciences, Fisheries-Oceanology and Chemistry) into the main (Suzzallo/Allen) library and adopted a new “reading room” service model for the Physics/Astronomy Library. As part of the consolidation UW developed a new “Research Commons” in the real estate that was the Natural Sciences Library.

Background
I officially began my position as the Natural Sciences and Resources Librarian with the University of Washington Libraries in 1997. At that time there were 22 libraries on three campuses. My original position was designed so that I worked regular hours in four of the branch libraries, three located on the Seattle Campus - Natural Sciences, Fisheries Oceanography, Forestry (which I also managed in the summer months) - and Friday Harbor, the library at our marine labs in the San Juan Islands, for which I was also Head of the library. In addition, I also worked occasionally in the Engineering Library where I had held a position as a graduate student.

At the University of Washington Libraries, many of the smaller, departmental libraries had closed over the years, including Geography and Philosophy, but then things were stable for a number of years. In 2004, the decision was made to close Forest Resources Library upon the retirement of the librarian. That library was integrated into the Natural Sciences Library and I was assigned the subject areas of Forest Resources and Environmental Sciences.

Science Branch Library Closures
In 2008, due to a struggling economy, budget cuts, and having moved to mostly online journals, UW Libraries looked again at branch closures. All of the proposed closures were science libraries. The rationale was that the sciences were heavy users of journals which were now mostly available online. Libraries Administration also was eager to develop a “Research Commons” to be focused on graduate students of all disciplines, and the first choice of real estate was the ground floor of Allen Library South, the main floor of the Natural Sciences Library.

I served on a committee for a year that looked at multiple options, including making Allen Library South a “sciences tower” with the ground floor of the new sciences library acting as the “research commons.” That idea never gained traction, and the decision was announced to close Natural Sciences, Fisheries-Oceanography, Chemistry, and Physics. Later that year, the Social Work Library was also closed.

Challenges
Of the librarians working in these libraries, one was in a temporary position that was not renewed, one moved to the Engineering Library, and five went to Suzzallo/Allen Library. The
staff members were relocated to other Seattle campus libraries and were given a say in where they were assigned.

Surprisingly (to the science librarians, anyway), there was little resistance to the idea of closures from the affected departments and faculty. Since the Natural Sciences Library was physically located within the larger Suzzallo-Allen Library it was not called a closure, but a “merger.” It is possible that members of many of the natural sciences subject departments were distracted by the merger of their Colleges and Schools into the new College of the Environment. The Physics-Astronomy Library was the lone exception.

The Physics Department had major objections to the proposed closure of their library and waged a battle to keep it open. The end result was financial support from the department and a new MOU regarding the library that turned it into the “Physics Reading Room.” The collections were left in place, but there would be no regular librarian and the library would be “lightly staffed” mostly by iSchool graduate students. The Physics Librarian ended up splitting her time between the Physics Library and the Engineering Library.

The physical move took place during the summer of 2009 and was an enormous challenge. The entire contents of three libraries were moved into the Suzzallo/Allen Libraries stacks, and the entire run of the Suzzallo/Allen Libraries, including journals, was put into a single A-Z call number run. In total, this required that over four million physical volumes be moved, including 670,000 books moved to or from the off-site Sand Point Shelving Facility.

**Benefits**

There have been many positive outcomes from moving the branches into the main library. There has been a high degree of increased cooperation, especially between librarians representing different disciplines and subject areas. For example, we put on a full day of seminars, presentations, and lightning talks in cooperation with the Department of Communication, College of the Environment and the Graduate School called SEAchange. It brought together faculty, students, and outside speakers to talk about how communication patterns were different after the Exxon Valdez and Deepwater Horizon disasters. See: [http://guides.lib.washington.edu/SEAchange](http://guides.lib.washington.edu/SEAchange).

Another benefit was new and improved user spaces. What had been the first floor of the Natural Sciences Library became the Research Commons. It was completely redone with new furniture, carpeting, technology, and brightly colored walls. It was built using small capital money and a one-time gift from the Provost.
The Research Commons is extremely popular and highly used. Students love the whiteboard walls and the multi-purpose areas. We also added technology including Media:Scape stations so students can work collaboratively.

We also included a large space that can be used for classes or presentations. Presentation Place is modular so that it can be reconfigured for use by both large and small groups.
In addition, in the midst of budget cuts to the whole institution, there were no staff layoffs due to branch closures and mergers. In Suzzallo Library, positive changes also included additional space realized for collection growth, the call numbers were moved into a single A-Z run, and journals and books were interfiled. We have gotten a lot of positive feedback from users regarding the improvements to usability of the collection due to these changes.

So how did the staff feel about the changes after the dust settled and we were in our new positions? We were still feeling a little shell-shocked. The downturn in the economy after 2008 also led to a feeling of constant low-level stress. Too many years without a raise, too many things added to everyone’s plates, and just a constant level of stress led the Libraries’ HR to institute a “Wellness Program.”

It started with a pilot program of once-per-week yoga. It was so successful that it is now an ongoing class, and a walking program of lunchtime strolls around the campus was started. We even had a visit from therapy dogs!

*Figure 10. Presentation Place.*

*Figure 11. Wellness program: Yoga, walking, and therapy dogs.*
So, how are we feeling now after four years? We’re feeling very, very good. The moral of this story is...change is stressful and anything worth building takes time. And, on a personal note, one of the best outcomes for me is that I get to work in one of the most beautiful libraries in the world, Suzzallo Library!

![Suzzallo Library Reading Room](image)

**Figure 12. Suzzallo Library Reading Room.**

**References (Entire Panel)**
GREEN FLASH PRESENTATIONS

Moderator: Kristen LaBonte
University of California Santa Barbara
California, USA

A “Green Flash” is the moment of green light that flashes just as the sun sets or rises over open water. The Green Flash in IAMSLIC refers to those brilliant moments of clarity or insight that occur. They are brief discussions about new discoveries or moments of brilliance in our libraries.

1. SCOR/IODE/MBLWHOI Library Data Publication Project Produces the Ocean Data Publication Cookbook. Lisa Raymond.

The goal of the Scientific Committee on Oceanic Research (SCOR), International Oceanographic Data and Information Exchange (IODE) of the Intergovernmental Oceanographic Commission and Marine Biological Laboratory Woods Hole Oceanographic Institution (MBLWHOI) Library project has been to identify best practices for tracking data provenance and clearly attributing credit to data creators/providers so that researchers will make their data accessible. The assignment of persistent identifiers, specifically DOIs, enables accurate data citation.

The MBLWHOI Library has developed a workflow and metadata guidelines to deposit datasets in the Institutional Repository (IR), the Woods Hole Open Access Server (WHOAS). DOIs are assigned and registered with CrossRef.

The Published Data Library (PDL) has been implemented by the British Oceanographic Data Centre. It provides snapshots of specially chosen datasets that are archived using rigorous version management. Using metadata standards adopted across NERC's Environmental Data Centres, the repository assigns DOIs obtained from the British Library/DataCite to appropriate datasets. The project team has compiled a Cookbook (available online as IOC Manuals and Guides No. 64; http://www.iode.org/mg64) to enable other data centers and libraries to institute these services.

The British Oceanographic Data Centre and the MBLWHOI Library are actively assigning DOIs to appropriate datasets enabling accurate citation and preservation. This ensures accessibility to the broader community and provides an incentive to the original researcher to make the data available. Repositories that assign DOIs to data objects are providing services not yet provided by most large national or subject data repositories. These repositories are not meant to replace traditional data centers, but rather complement the data center by providing formal data
Further, this project demonstrates that data publication that enables accurate citation of data sets is manageable for organizations of any size.


3. RENOVATION OF A LIBRARY BUILDING AT THE UNIVERSITY OF MASSACHUSETTS DARTMOUTH. Elizabeth Wlniarz.

4. “WHEN YOU DON’T GET IT RIGHT THE FIRST TIME, KEEP TRYING.” Joan Parker. Her library’s mantra.


POSTERS

Moderator: Marcel Brannemann
Alfred Wegener Institute for Polar and Marine Research
Germany

ARCHIVING THE PROJECT MANAGEMENT INFORMATION OF THE CENSUS OF ANTARCTIC MARINE LIFE. Daria Cole (University of Alaska Anchorage, Consortium Library, USA) and Victoria Wadley (Australian Antarctic Division, Australian Government, Australia).

The Census of Antarctic Marine Life (CAML), a key activity of the Scientific Committee on Antarctic Research and a major initiative of the recent International Polar Year, measured the distribution and abundance of life in the Southern Ocean around Antarctica to assess potential changes and develop new paradigms for biodiversity in the marine environment. Published CAML results can be tracked in traditional databases, and institutional repositories and data centers are storing the metadata and related datasets. However, another type of ‘metadata’ exists—the “grey literature” produced during the development and ongoing activities of the CAML project itself that are not typically available because of lack of publication or a means of distribution. This poster outlines the steps taken to save CAML’s non-traditional information, a unique and informative contribution of intensive planning and international cooperation efforts that would have likely been lost when the project ended. The CAML project has made this valuable information readily available by capturing and converting these miscellaneous documents to PDF format. The CAML Project Archive, available through NASA’s Global Change Master Database (http://gcmd.nasa.gov/) and maintained by the Australian Antarctic Division’s Data Centre (http://data.aad.gov.au/), includes information such as internal and annual reports; maps of voyage routes and sampling areas; sampling protocols; research synthesis and research plans; meeting agendas and minutes; and much more. The success achieved through archiving the CAML project documentation in a freely available repository also serves a model for organizing the gray literature of future research projects, particularly when international or multi-institutional collaborative efforts are involved.

EXPANDING THE CONCEPT OF LIBRARY: STRENGTHENING THE ACADEMIC AND RESEARCH LIBRARIANS’ ROLE. Gail Donovan (New College of Florida, Jane Bancroft Cook Library, USA) and Susan Stover (Mote Marine Laboratory, Arthur Vining Davis Library & Archive, FL, USA).

The function of the library is evolving and librarians have enhanced their skills and expanded their role to help strengthen the library’s purpose and value. As part of this change many academic and research librarians have become data curators or librarian archivists. They are involved in the creation and curation of e-repositories for their institutions’ research data and scholarly publications. Others have incorporated and promoted the idea that the library is also an archive for historical institutional papers and various unique collections. These librarian archivists or special collection librarians provide access to primary source documents along with
the historical context, as well as, related secondary documents from digital and print collections. Even though libraries, archives, and digital repositories have common goals to acquire, organize, preserve and provide access to their materials, their policies on access, use by the public, standard practices, cataloging, and even vocabularies are different. This poster will compare and contrast the software, tasks and terminology used by librarians, archivists and data curators to organize, preserve and present the historic, ecological and scientific materials in an Academic and a Research Library.


This poster presents the main results of the participation of marine and aquatic science libraries in Cuba in a regional digital repository with the first contributions to the Project OceanDocs IOC/IODE/UNESCO (http://www.oceandocs.org) in 2006. It shows the progress made by the Fisheries Research center (CIP), Institute of Oceanology (IdO), the National Aquarium of Cuba, Center for Marine Research, Marine Bioproducts Center, and Research Institute of Food Industry to provide access to magazines, scientific papers, theses, national and international brochures, books, newsletters and other documents. The poster explains the procedures proposed by the Fisheries Research Center (CIP) aimed at increasing the visibility of local scientific research, and harnessing the power of OceanDocs. These also contribute to the performance and evaluation of the researchers at CIP, the coordinating entity and representative of Cuban libraries for this project, which is responsible for collecting, reviewing and validating all documents and data to ensure compliance with the terms of the reference and copyright policy established by OceanDocs. We show the value of the joint work between libraries of the marine scientific community to strengthen the Open Access movement with the use of digital tools, courses, training, workshops and conferences in this field, which is necessary to increase awareness of the aquatic and marine scientific research in the region.

THE OVERHAUL OF COLLECTION EVALUATION. Beth Fuseler Avery and Karen Harker (University of North Texas, USA).

For many years the University of North Texas (UNT) Libraries used a minimalist approach in evaluating the collections for accreditation reviews. The Library Director would send a letter indicating the amount spent on and the number of resources in the entire collection and the specific subject area being accredited, the name of the subject librarian, and consortial memberships. This simplistic approach was of very limited use to the academic department in determining the value of the collection to its program and the limited information gave little direction to the Libraries on how to develop the collections and services to support the curriculum.
In mid-2010 the Collection Development Department was formed. At the same time the University was seeking to obtain Carnegie Classification™ RU/VH research university status. In order for the libraries to support this level of instruction and research, we needed to know more about our collections and services. We decided that one way to get a better view of how we supported each curriculum was to do a better job providing information for accreditation, University program reviews, and support for new programs. So began the evolution of the reports we provide.

We started by determining what information was missing in order for us to make decisions about enhancing the collections. The immediate needs were:

1) Longitudinal trends in spending, collection growth, priorities;
2) Comparisons with peers – collection size, scope and depth, funding;
3) Details about the liaison – qualifications, experience, services;
4) Connections with accreditation requirements.

We then did a lot of hard, time-consuming work to gather background information. First we compiled a literature review on collection assessment methods and measures. Then we compiled and evaluated the schedule of accreditation reviews. These reviews are done on varying schedules from 5 years to 10 years. We realized that not all subjects taught at the University were covered by discipline-specific accreditation and decided to include the internal program review to our list of evaluations. The University conducts periodic reviews of all academic graduate programs in order to promote academic quality and productivity and to assure alignment with the mission of the institution. This is generally done on a 7-year cycle. Next we selected the most useful measures and methods. We looked at which methods we currently had the data for and/or could collect with what we currently know about our collection profile and collection usage. The measures we selected were informed by the literature and were meant to provide a more holistic picture of the collection than absolute numbers of holdings and circulations. They include relative percentages by subject, distributions by age and format, comparison of holdings with interlibrary loan requests, and longitudinal trends in expenditures and usage.

A key feature of our evaluations is the comparison with peer institutions. Standard reports such as the ACRL Survey of Libraries and the NCES American Libraries tool provide comparisons of overall library expenditures, holdings and services. For more detailed comparisons of specific holdings, we looked at peer review comparison tools and selected the WorldCat Collection Analysis System, now WorldShare Collection Evaluation System. While this tool isn’t perfect, and since its revision seems less so, it is useful for doing the kinds of subject-area comparisons we wanted to include in our reports. We are able to provide overlap rates and benchmark rates with specific libraries, as well as with standard collection development tools, such as Resources for College Libraries and CHOICE’s Outstanding Academic Titles (OAT).

Then we developed a flowchart with a timeline of all steps in the process, which would take 6-8 weeks (see Figures 9 and 10). We presented this process to the Dean of Libraries, who then presented it to the University Provost’s Council to inform the other Deans of this process and the value that this service can provide. We also unveiled the process to the Libraries’ Subject Liaison librarians, who would be an important part of the process. They are to meet with
the Collection Assessment Librarian, the Coordinator of Collection Development, the academic department faculty representative to the library, and the academic department representative in charge of the specific review to discuss the process to identify the peer groups, and any additional information needed for the departmental review. They will also be the ones to work with the departments in the future to address any gaps in the collection identified in the review.

Figure 9. Collection Evaluation Flowchart.
Figure 10. Collection Evaluation Flowchart (cont'd).
Current reports include longitudinal trends in collection numbers and budgets, peer comparisons, lists of key resources, strengths and gaps in the collection. Peer comparisons include overlap, benchmark, funding, and usage.

The sections of the current report are:

1) Executive Summary with an overall assessment and plan to address issues identified in the body of the report.

2) Introduction giving background information and an assessment of the adequacy of the collection for the academic area.

3) Collections including sections on print and electronic journal holdings, holdings of print and electronic monographs, comparisons of circulation with interlibrary loans, comparison of monograph holdings with current and aspirational peer institutions, library expenditures for at least 3 years, and the collection development policy.

4) Library Services including staffing numbers; details about the subject liaison librarian; discovery, access, reference and Interlibrary Loan services with information about the online catalog, discovery services, subject and class pages; numbers of service transactions and online access.

5) Library Facilities and Equipment, which gives hours of operation and services hours; details about available computer, printers, copiers and adaptive equipment.

6) Assessment, giving details about the types of assessment conducted and results pertinent to the academic area.

Our reports continue to evolve as we identify more measures and data that can be used to develop our collections. We will be developing collection specific policies to complement our general policy and to insure that our collections are at the ideal levels for supporting research and instruction.

APPROACHES TO THE STUDY OF THE MARINE SCIENCES DOMAIN THROUGH THE SCIENTIFIC RESEARCH PUBLISHED IN THE CUBAN JOURNAL OF MARINE RESEARCH. Yuriem Lezcano Lopez (Center for Marine Research, University of Havana, Cuba) and Dr. Susana Barbarian Sanchez Vignau ((Center for Marine Research, University of Havana, Cuba).

The scientific research published in the Journal of Marine Research (RIM) is analyzed for the period 2003-2010 for bibliographic reference, production, authorship, referenced sources, and subject terms. It concludes that domain analysis constitute a new approach in the discipline of information science. The RIM database constituted the primary source of information for obtaining a closer look into the behavior of the proposed bibliometric indicators, which account for 14 fields, some of which had limitations due to the lack of uniformity of the bibliographical references. RIM showed a stable regularity in the issue of the numbers and declared volumes. A relatively small group of authors contributes a substantial number of the works. The analysis of the collaborations between authors reflects the interdisciplinary teamwork. Among the
institutions contributing to RIM, most are in the domain of marine sciences, especially marine ecology, system analysis, and aquaculture, corresponding to the topics covered by RIM and some of the research priorities for the country. The most mentioned papers are classics of scientific literature on marine sciences, and most of their authors belong to prestigious US institutions. The most mentioned sources were journals, followed by books and monographs. The most mentioned journal was RIM, indicating that it serves as a reference for authors from the Centre for Marine Research (CIM), who contribute 58% of the analyzed publications, and other Cuban institutions. This together with editorial approaches that favor Cuban authors (according to Perez Gomez et al. 1997) tends to devalue the publication and affects its visibility and inclusion in databases and international assessment systems. Hence, placing RIM in databases, directories, catalogs and open access repositories would increase the visibility of authors in the marine sciences in Cuba.