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# Shaping Up: Boot Camp and Other Programs Addressing Professional Development Needs of Science Librarians

Sally A. Gore

**ABSTRACT.** Scientists in the twenty-first century work collaboratively with online tools, relying almost exclusively on online resources and sharing publications freely online while generating and utilizing large datasets. As a result, the librarians charged with providing services to the scientific community face both opportunities and challenges in keeping up in this electronic, digital environment. In order to meet these challenges, library leaders from the five campuses of the University of Massachusetts System established an on-going e-Science initiative. This initiative focuses on increasing awareness and understanding of the principles of e-Science, while improving general knowledge within different scientific disciplines. Programs of varying lengths and focus provide local and affordable professional development opportunities that improve the working librarian's ability to better serve scientific researchers and students.

**KEYWORDS.** Boot camp, collaboration, continuing education, e-Science, partnership, professional development, science librarians

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## *INTRODUCTION*

Just as amino acids are the building blocks of proteins, serving as intermediaries in metabolism and versatile players in chemical structure, so have libraries and librarians long been the intermediaries and multipurpose agents at the center of academic and health sciences research. In order for any foundation to remain strong, the building blocks that comprise it must maintain their composition in order to continue being useful and relevant. Academic science and research libraries have traditionally found their strength and structure in building important collections of journals and research materials, and making them accessible to the research community. As digital collections and desktop accessibility replaced much of this type of work for libraries, librarians are often left struggling to redefine their role in a continually changing information environment.

However, versatility is a hallmark of the library profession. Finding new and significant ways to use their skills and expertise is a call librarians are well-equipped to successfully heed. The librarian's role, mediating between information created and information needed, remains. Although the format of information has changed, the responsibility of the librarian to collect, gather, organize, and make this information accessible to the people who require it is still essential. Moreover, passing on these skills to the research community is much desired. As noted in a recent *Nature* editorial, "... most university science students get a reasonably good grounding in statistics. But their studies rarely include anything about information management – a discipline that encompasses the entire life cycle of data, from how they are acquired and stored to how they are organized, retrieved and maintained over time."<sup>1</sup>

Clearly, vital roles exist where libraries and librarians can insert and/or reestablish themselves. While the basic concepts of information management are the specialty of the field, gaps in the existing knowledge and skill set of librarians must be addressed in order to find success in today's world. The purpose of this paper is to show how one group of librarians within a university system is addressing this challenge.

### *FINDING SOLUTIONS*

Today's scientific community is just beginning to understand the need to organize, safeguard, and share increasingly large amounts of information, including complex datasets. While numerous definitions of e-Science exist, one of the most frequently cited comes from Tony Hey, Corporate Vice President of Microsoft Research. Hey outlines the role of libraries in an e-Science world as follows:

The next decade will see the emergence of a new, fourth research methodology, namely "e-Science" or networked, data-driven science. Many areas of science are about to be transformed by the availability of vast amounts of new scientific data that can potentially provide insights at a level of detail never before envisaged. However, this new data dominant era brings new challenges for the scientists and they will need the skills and technologies both of computer scientists and of the library community to manage, search and curate these new data resources. Libraries will not be immune from change in this new world of research.<sup>2</sup>

To address and prepare their professional staff to meet these challenges, library administrators from the five campuses of the University of Massachusetts (UMass) System established an e-Science initiative. An ad hoc committee of science librarians from the five campus libraries (UMass 5 Group) was formed in order to organize a series of events to educate librarians on an ongoing basis about the applications of e-Science.

Initially focused primarily on the data aspects of e-Science, it soon became apparent that a lack of specific, sometimes even general, disciplinary knowledge among science librarians is a hindrance to approaching researchers or embedding librarians into the scientific arena. This disciplinary knowledge arose as a fundamental first step for success of library services supporting e-Science. The domain knowledge of professional librarians is often insufficient alone to assist researchers effectively in the use of databases and other subject-specific tools. For example, it is virtually impossible for a librarian to instruct biomedical researchers and students on using the host of biotools offered from the National Center for Biotechnology Information (NCBI) without at least some general understanding of basic biology and biochemistry. The librarian who did not major in, or even recently study, the sciences finds himself or herself charged with a daunting task.

Time restraints and the added financial cost of education further constrain the working science librarian. Lacking reasonable means of returning to school to earn a second subject degree, the challenge for library leadership and administration is to provide ways for their staff to gain the needed knowledge in a practical, affordable way. Given a directive and financial support from the library directors, the UMass 5 Group developed and led several annual events; they also assisted with other programs organized by the University of Massachusetts Medical School (UMMS) and the National Networks of Libraries of Medicine/New England Region (NN/LM

NER). The year 2011 will mark the third consecutive year of these events, which have gained in popularity as word spreads of their relevance, affordability, convenience and admittedly, their fun.

### ***PROFESSIONAL DEVELOPMENT AND CONTINUING EDUCATION***

On academic campuses, highly educated researchers represent a ready and available source for educating librarians. Utilizing the different faculty, research centers and areas of expertise of the 5 UMass schools, events are organized to quickly immerse attendees into particular scientific disciplines. Both one-day and multiple day events are organized. They are offered either free of charge or for a modest registration fee. All continuing education activities include a time for lectures and presentations by researchers, as well as time for open discussion with the audience. Hands-on activities and tours of the different facilities are also included when appropriate. Two events, one called Professional Development Days and the other called Science Boot Camp for Librarians, take place in the spring and summer, and are hosted by the different UMass libraries on a rotating basis.

#### ***Professional Development Days***

***Exploring Stem Cell Research: What does it mean for librarians?*** This professional development day was hosted by the Lamar Soutter Library and the Center for Stem Cell Biology and Regenerative Medicine, UMMS in May of 2009. The program consisted of an introduction to stem cell biology; an overview of the International Stem Cell Registry

<<http://www.umassmed.edu/iscr/index.aspx>> housed at UMMS; a discussion of intellectual property and patent issues related to stem cell research; a thought-provoking talk on the bioethical considerations with stem cell research; a hands-on tour of the Stem Cell Center; and a wrap-up table discussion of the evolving roles and opportunities for librarians in this field (see Figure 1). Approximately 60 librarians from across the area attended this informative day-long workshop. Materials from the day are available for all to access online via the Lamar Soutter Library website <[http://library.umassmed.edu/escience\\_symposium09.cfm](http://library.umassmed.edu/escience_symposium09.cfm)>.



**Stem Cell Websites**

UMass International Stem Cell Registry  
<http://www.umassmed.edu/iscr/index.aspx>

UMass Stem Cell Bank  
<http://www.umassmed.edu/MHSCB/index.aspx>

The National Institutes of Health  
Resource for Stem Cell Research  
<http://stemcells.nih.gov/info/basics/>

StemCellResources.org  
<http://www.stemcellresources.org/>

Nature Magazine's stem cell site  
<http://www.nature.com/stemcells/index.html>

**Exploring Stem Cell Research:  
What does it mean for Librarians?**

Professional Development Day for Area Medical Librarians

Hoagland-Pincus Conference Center  
University of Massachusetts Medical School, Shrewsbury, MA  
May 13, 2009



Co-sponsored by  
The Lamar Soutter Library  
The National Network of Libraries of  
Medicine, New England Region  
North Atlantic Health Sciences Libraries  
and  
New England States Consortium Systems Organization (NESC50)

Figure 1. Announcement for first Professional Development Day held as part of the 5 Campus UMass Libraries e-Science initiative.



### ***Nanotechnology in the Health and Applied Sciences: Implications for Librarians and***

***Researchers.*** A second professional development day was held in May 2010 at the Integrated Science Building and Silvio O. Conte National Center for Polymer Research at the University of Massachusetts Amherst. The program focused on the study of nanotechnology in health and other applied sciences. Librarians learned about the tools and language of nanotechnology, as well as some of the information resources that researchers in the field utilize, including InterNano <<http://www.internano.org/>>, a highly successful information resource portal managed by one of the science librarians of the UMass 5 Group.

Professional development days offer a reasonable, single-day option for continuing education for area science librarians. They also provide an experience to see the science in its environment and to network with both professional researchers and other science librarians. The next event is scheduled for March 16, 2011, at UMMS and will focus on data management skills and application.

### ***Science Boot Camp for Librarians***

For librarians seeking a more in-depth continuing education experience, the planning group developed a “boot camp” to provide an intense immersion into several scientific disciplines over two and one-half days. The first annual Science Boot Camp for Librarians, held June 24-26, 2009 at the University of Massachusetts Dartmouth, was attended by approximately 50 librarians from the New England area. The University of Massachusetts Lowell played host to the second annual Science Boot Camp for Librarians, June 9-11, 2010. More than 60 librarians attended, representing not only New England, but states as far away as New Mexico and Colorado. Boot Camp even became an international affair when a librarian from Alberta, Canada took part!

Boot Camp is sponsored by the five UMass libraries and receives grant funding from the National Network of Libraries of Medicine, New England Region. Supporters and financial sponsors include the Boston Library Consortium, as well as several information science-related vendors.

The goal of boot camp is to provide a venue for multiple researchers from different disciplines to share their expertise with a group of librarians over a period of several days. Lectures are geared toward educating non-specialists. “Campers” are provided with a framework and vocabulary that will help them better engage their research faculty. At the same time, camp creates an environment for dialogue between these two groups, whereby the information needs of working scientists and the information skills of librarians can find common ground. UMass faculty researchers are recruited and represent the various disciplines of the campuses. In the two years of camp, scientists outlined the current direction of research in six fields: bioinformatics; geographic information systems; nanotechnology; genetics and gene therapy; remote sensing; and climate change (see Figure 2).

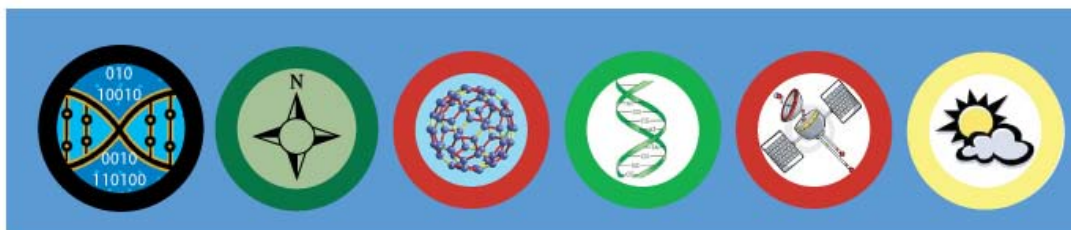


Figure 2. Science Boot Camp for Librarians merit badges (L-R), Bioinformatics (2009), Geographic Information Systems (2009), Nanotechnology (2009), Genetics and Gene Therapy (2010), Remote Sensing (2010), Climate Change (2010).

Each session is devoted to a particular scientific field and divided into two parts. The first covers general background and theory of the subject, while the second focuses upon the science in practice, i.e., an applied piece. For example, three faculty members from UMass Medical

School spoke on the topic of genetics and gene therapy. One professor provided attendees with the basics of human genetics. The two researchers from the UMMS Advanced Therapeutics Cluster, Gene Therapy Center followed with descriptions and examples of the work being done in this emerging medical field. Combining theory and practice not only gives everyone a better sense of the science, but also provides practical talking points for future discussions with researchers at their home institutions.

At the request of first-year attendees, a capstone lecture was added for the last day of the second boot camp. This session provides an opportunity for a librarian to present his or her innovative work in the field of e-Science. In addition to showcasing interesting projects, the capstone also gives librarians at camp a real example of what's possible when the right pieces of support and innovation come together. For the first capstone, a librarian from the Mann Library, at Cornell University, gave an overview of DataStaR, the Library's data staging repository <<http://datastar.mannlib.cornell.edu/>>.

All presentations at boot camp are recorded and made available for future reference to both attendees and other interested librarians.

Finally, it's no secret that fun is a big part of Science Boot Camp for Librarians. The theme of "summer camp" is carried throughout with camp songs, merit badges, a non-sensible shoe contest, the smashing of a boot-shaped piñata, and late-night sing-a-longs in dorm rooms (see Figures 3 and 4). Boot camp has been an overwhelming success, and planning is underway for the next edition to be held June 8-10, 2011 in Worcester, MA.

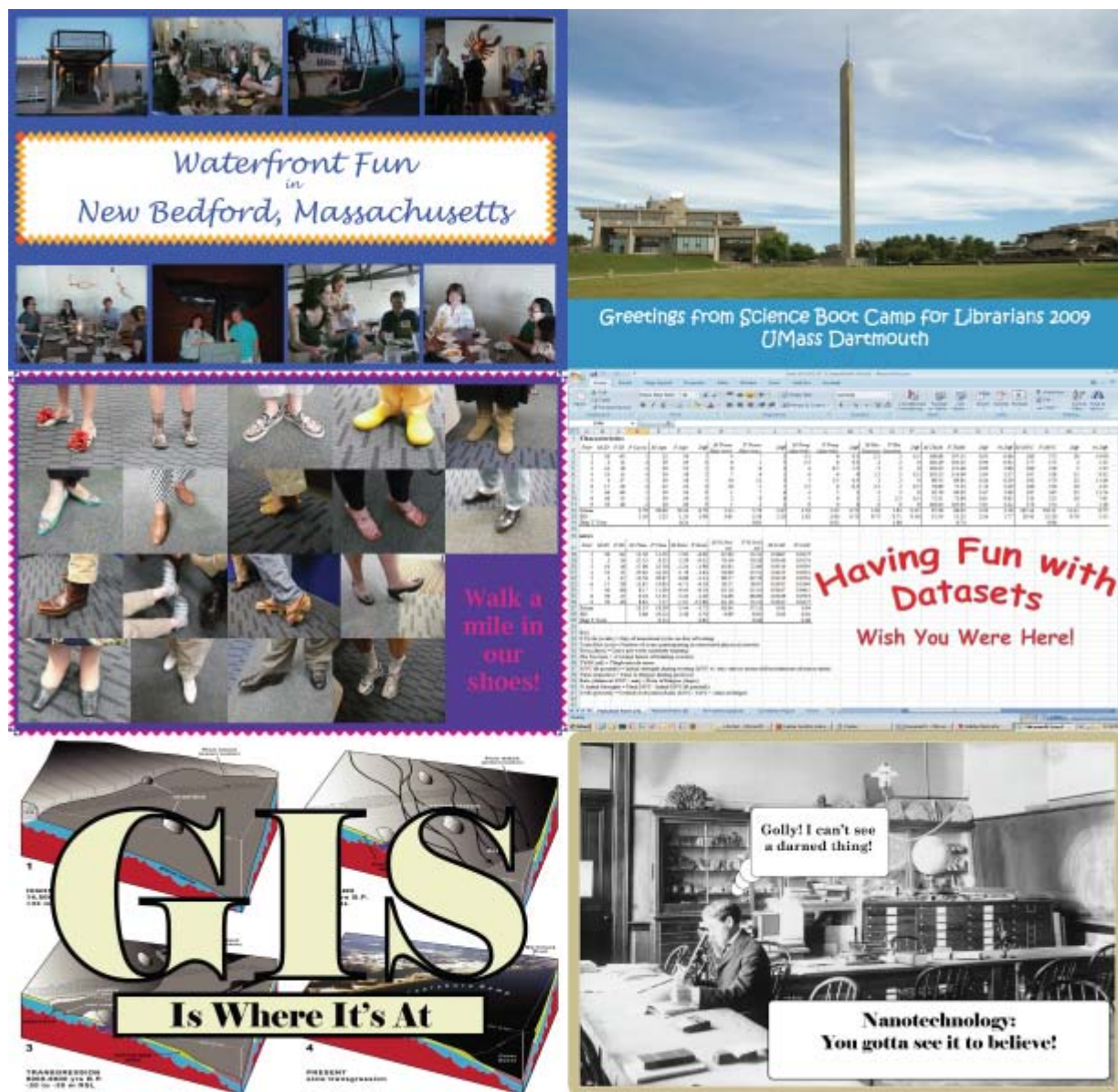


Figure 3. Series of "Postcards from Camp" highlighting events from Science Boot Camp for Librarians, 2009.

### Little Data Sets

Little data sets on the desktop  
Little data sets filled with data files  
Little data sets on the desktop  
Little data sets all the same

Labeled green ones, labeled pink ones  
Labeled blue ones, labeled yellow ones  
And they're all filled up with data files  
And they all look just the same

And the proteins in the sequence all line up in their cluster groups  
And they all result in data, all the data all the same  
And there's scientists and computer folk  
And bioinformaticists  
And they're all cranking out the data and it all looks just the same

And they all work at their bench tops and they work in computer labs  
And they all make great discoveries, great discoveries all the same  
There's mutations, annotations  
And gene characterization  
And it all creates more data and it all looks just the same

So librarians go to summer camp and back to the universities  
Where they're sent out for the data, all the data all the same  
And they work with all the scientists  
And then with computer folk  
And they organize all the data sets so they're not all just the same

And the scientists in their lab coats sing praise to the great librarians  
Who gathered all their data, all their data all the same  
Now expressions, interactions,  
Now structures and analyses  
All the data in neat data sets where they're all shared just the same

*(To the tune of "Little Boxes" by Malvina Reynolds, 1962; lyrics by Sally Gore, 2009)*

Figure 4. Sample camp song.

## ***DEVELOPING PARTNERSHIPS AND COLLABORATIONS***

Collaboration is an essential piece of e-Science. Increasingly, science crosses disciplines, forging partnerships between multiple groups both inter- and intra-institutionally, regionally, nationally and internationally. E-Science is networked science and thus is not limited by the physical boundaries that existed before today's digital world.

As scientists learn to work with one another, librarians also need to develop partnerships amongst themselves, as well as with researchers. The UMass 5 Group itself is an excellent example of a successful collaboration between different subject/discipline librarians, though all science-based, from different institutions. The UMass e-Science initiative also focuses on the ability to create and foster effective partnerships critical for success. Several projects address this goal.

### ***Regional e-Science Symposium for Librarians***

The very first event organized under the e-Science initiative was a day-long symposium introducing the topic of e-Science to a select audience of regional academic, health sciences, and sciences librarians, as well as several administrators from UMMS including the Chancellor and Vice Provost for Research. Held in April of 2009, the event served as part educational program, part resource workshop, and part think-tank. In total, more than 60 librarians representing approximately 30 different libraries took part in the event.

The symposium program was divided into a morning of presentations, a panel discussion and a keynote address, followed in the afternoon with a lunch-time speaker, breakout sessions,

and facilitated group discussion. The broad goal of this initial symposium was to increase awareness among New England area librarians of the importance of e-Science and the role of the library in support for scientific research. The symposium was also intended to develop a strategy for regional collaboration in the delivery of e-Science resources and services. The outcome was a written report with specific recommendations for area librarians to explore in supporting scientific research in their institutions.

In response to the success of the first symposium, a second event took place in April 2010. Speakers on this day highlighted specific programs and projects currently underway that demonstrate libraries and librarians taking an active role in e-Science. Programs such as DataStaR at the Mann Library, Cornell University <<http://datastar.mannlib.cornell.edu/>> and the Institute for Data Intensive Engineering and Science (IDIES) at Johns Hopkins University are exemplary models of these new collaborations between academic libraries and research centers. Smaller projects were showcased in afternoon poster presentations. The day concluded as it had before, offering the chance for librarians to engage in facilitated discussions about the opportunities and challenges that lie ahead for working with e-Science. The next e-Science symposium is scheduled for April 6, 2011.

### *e-Science Portal for New England Librarians*

One of the clearest objectives emerging from the first e-Science Symposium was the desire for a centralized, web-based resource that would enable librarians to locate information about upcoming events and current practices related to e-Science, to find tutorials and other self-paced educational tools to continue learning about different scientific disciplines. Another desire was

for a virtual community for ongoing discussion with other librarians interested in e-Science. With this objective in mind, the NN/LM, NER at UMMS applied for and received funding from the National Library of Medicine for the development of an e-Science web portal. Supported by the New England region of NN/LM, the portal will emphasize projects and encourage discussion among New England science and medical librarians. However, as a web-based tool its ability to provide a centralized resource for e-Science materials reaches beyond this corner of the United States (see Figure 5).



Figure 5. e-Science Portal for New England Librarians Web site banner.

An Advisory Board formed in December 2009 and adopted the following scope statement for the portal:

The e-Science portal will be a central resource for librarians to learn about and discuss issues related to e-Science, e-Science subject areas, and the impact of e-Science on the profession. The portal will primarily serve librarians and library administrators working in institutions that are generating, sharing, storing and/or using data for basic scientific, clinical or translational research in the health, biological, and physical sciences. As such, the portal will bring together resources on education, outreach and collaboration, best-practices, and current events for e-Science. The portal will provide librarians with the tools, knowledge and skills to effectively participate in networked science.<sup>3</sup>



The Advisory Board is responsible for assisting with the development of a strategic plan, portal development, and promotion of the resource once it is finished. Other librarians from across the region serve as editors for different sections of the portal. They collect and create content, offer suggestions for design, and work closely with the Project Manager to update and maintain the site. The project is currently funded through April 2011, which is also the official launch date of the website. The e-Science portal will serve as a primary continuing education tool for librarians engaged in science librarianship of all kinds.

### ***RELEVANCE TO OTHER INSTITUTIONS***

Over the past two years, approximately 300 librarians representing more than 50 different libraries and institutions have benefited from the educational programming and partnership activities coordinated by this UMass Five Campus e-Science initiative. Some of these are taking the model back to their campuses to institute similar programs for their colleagues. Other regions of the NN/LM are following the success of New England to develop webinars and day-long professional development programs for librarians in other parts of the country. The planning group for boot camp has also grown to incorporate several other universities outside the UMass system with an interest in the program, expanding the opportunities for librarians and researchers from different campuses to take part.

The UMass 5 Group and new partners continue to plan the annual events for 2011, including a professional development day, symposium, and summer boot camp. In the future, the e-Science Portal for New England Librarians will provide an ever-expanding resource for

librarians to increase their knowledge of related issues, as well as to contribute their own expertise for the benefit of colleagues.

Often, cross-campus collaborations and consortia form amongst libraries for the purpose of resource sharing, specifically document delivery and borrowing, licensed agreements, or offsite storage space. These are all viable options and reasons for libraries to work together. The UMass Five Campus Libraries e-Science initiative demonstrates the value in sharing the resources of people, i.e., the expertise of faculty, researchers, and librarians, to address the opportunities and challenges of working in the e-Science world. This seems even more appropriate given the definition of e-Science as “networked science.” Like the researchers practicing this methodology, the science librarians of the UMass 5 Group are doing the same, using the technology available today to plan, organize, and carry out an effective series of continuing education and professional development events. It is a true example of putting theory into practice.

### *CONCLUSION*

Regionally planned and cooperatively organized, the events of this initiative serve as innovative models for ongoing education and development for librarians addressing any area of library service, be it traditional or cutting edge. Events are planned and executed within a relatively short time frame. Because they are targeted toward a smaller geographic region, they are more affordable for the participants than national meetings requiring longer travel. Small, regional educational opportunities, drawing upon the expertise of local researchers, the facilities of local institutions, and the funding of regional organizations, enable librarians to keep current and to do

so economically and collaboratively. Now well-established in New England and beginning to be copied elsewhere, the hope is that the successful professional development programming model developed by the UMass 5 Group will be further replicated in other regions of the country, among other libraries, institutions, and working groups.

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