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The NASA Library and Researchers at Goddard: A Visitor's Perspective

Jill H. Powell
Engineering Library
Cornell University
Ithaca, New York
jhp1@cornell.edu

Abstract

Jill Powell, engineering librarian from Cornell University, visited the library at NASA Goddard in Greenbelt, Maryland in July 2013, interviewing library staff and selected NASA scientists. She studied the library's digital projects, publications, services, and operations. She also interviewed several NASA scientists on information-seeking behavior and library use. Her results discuss generational differences and applicability to other scientific academic libraries.

Introduction

NASA Goddard Space Flight Center in Greenbelt, Maryland is one of the largest combined U.S. organizations of scientists and engineers developing and operating unmanned scientific spacecraft (NASA Goddard Space Flight Center 2013). In July 2013 I was fortunate to schedule a two-week visit to tour labs and interview library staff and select NASA scientists. Having helped Cornell faculty locate NASA documents in my library for many years and observing NASA sounding rocket launches from several locations, I was interested to talk with NASA scientists and engineers at their place of work and observe how they researched the engineering literature and used the library. This paper focuses on the library's digital projects, publications, and services in wake of fiscal problems. The interviews with scientists reveal use of the library may be different along generational lines (Baby Boomer, Generations X and Y). Understanding such behaviors may be useful in developing ways to serve users in other academic libraries.

NASA Goddard (Greenbelt, Maryland) is a 1,270-acre campus with 8,500 employees and over 30 buildings (NASA Goddard Facilities 2013). Besides the main campus, NASA Goddard manages other facilities and installations, including Wallops Flight Facility in Virginia, Goddard Institute for Space Studies in New York City, and the Independent Verification and Validation Facility in West Virginia. With over 50 current missions operating simultaneously, employees design, test, and track data satellites and telescopes -- in fact they do everything but launch. Launching rockets must be done in more remote places with plenty of room -- such as

Vandenberg Air Force Base, Kennedy Space Center, or NASA Goddard at Wallops Flight Facility in Virginia. Goddard is one of 10 NASA field Centers. They are located all over the U.S. including Ames (California), Armstrong (formerly Dryden) (California), Glenn (Ohio), JPL (California), Johnson (Texas), Kennedy (Florida), Langley (Virginia), Marshall (Alabama), and Stennis (Mississippi) (NASA Centers and Facilities Map 2014).

Popular missions, such as Hubble, make news with spectacular photographs of space, but there are many other scientific issues studied by NASA scientists. These missions can inform us about global warming, oil spills, tsunamis, forest fires, and receding glaciers. NASA discovered the Northwest Passage became free of ice for the first time ever in August/September 2012 (NASA Visible Earth 2014).

The Spacecraft System Development & Integration Facility, otherwise known as the largest clean room in the world at 10 stories tall, is where the newest telescope is being assembled. It is named after James Webb, a top NASA administrator during the Apollo years. This telescope will improve upon Hubble by being able to view infrared light and see up to 13.5 billion years back in time (James Webb Space Telescope 2014).

Library

NASA Goddard Space Flight Center Library (photo by Jill Powell)

The NASA Library at Goddard (the Homer & Newell Memorial Library) is a two-story facility with approximately 100,000 volumes, large picture windows, and plenty of tables and chairs, making it a pleasant place to study or hold lectures. The collection focuses on earth science, space science, engineering, physics, astrophysics, and chemistry. Goddard engineers and scientists are the primary users, but they seek information in different ways. Engineers design

and build satellites and instruments; they consult manuals, handbooks, and internal project documentation to solve specific tasks. They might also consult specific articles, although less often than scientists, who monitor the latest publications continually in their field. Scientists collect data from satellites to study the universe (i.e., the Hubble Space Telescope) and Earth (e.g., Landsat) and are expected to publish peer-reviewed articles and books with prestigious publishers (Reynolds-Pope, Chesnes, & Early 2010).

Like many libraries, Goddard is in the process of downsizing the physical collection and adding more digital collections. Library staff include a combination of civil servants and contractors, which can lead to benefits and challenges. For example, the process for hiring a civil servant is long (six months or more), but there is good job security. Contractors can be hired in one day but are more susceptible to layoffs.

In January 2012 the physical library was closed due to budget cuts. The Goddard union GESTA (Goddard Engineers, Scientists, and Technicians Association) filed a grievance against NASA for not following proper procedures. Some scientists were very vocal about keeping the library, and pointed out there is no nearby library to take its place. While they have borrowing privileges at the University of Maryland, the traffic getting there and parking is difficult. The union and management negotiated an agreement and the library reopened nine months later, albeit with reduced hours.

The abruptness of the closing decision became apparent when patrons were asked to return all their books to the library. A large number of books were charged out, and scientists were surprised to realize closing the library meant they'd have to return all the books (Personal Interview 2013).

NASA Publications

One useful investigation concerned the types of NASA documents that exist and how academic libraries might locate them. NASA distributes many publications which are mostly online. Examples include:

- **Spinoff** -- http://spinoff.nasa.gov - Yearly publication about successful NASA inventions licensed by companies commercializing the technology.
- **Ask Magazine** -- {http://appel.nasa.gov/archives/} Stories written by NASA project managers for other project managers.
- **NTRS** (National Technical Report Server) -- http://ntrs.nasa.gov/ - 1915 to date - NASA technical reports available to the public; includes NASA, NACA, NIX (images, movies). This database was closed from March through May 2013 while the agency reviewed content and removed those subject to US export control laws. It has since re-opened.
- **NASD** (National Aerospace & Science Database)- http://www.sti.nasa.gov/nasa-users/nasd-registration/ -- more comprehensive database of NASA technical reports, and includes some documents not open to the public. Access to those documents is restricted to authorized users and contractors.

NASA Goddard Library Repository

A major achievement of the library is the NASA Goddard Library Repository at http://gsfcir.gsfc.nasa.gov. Created by Goddard library staff, this collection is a major highlight of the library's offerings. It stores, distributes, and preserves digital publications, images, audio, and streaming lectures created by over 2,000 authors from both NASA Goddard Space Flight Center and Wallops Flight Facility. Types of materials include journal articles, technical reports, book chapters, presentations, case studies, and conference papers. One can easily browse the database and find interesting colloquia with topics such as "Automobile Safety: What You Don't Know Can Kill You," presented by Byron Bloch to "Prospecting the Asteroids" by Thomas D. Jones. With Nobel Prize winning scientist John Mather on staff, a

large number of resident and visiting publishing scientists, and frequent lectures and events, there is much to preserve and make available.

Library staff commented that focus groups gave them useful feedback about their library web site. The three most useful items needed by their patrons on the front page are a search box, contact us page, and link to renew materials (Personal Interview 2013).

Library Operations and Collections

With deep budget cuts, the library has been unable to afford to order print books anymore. They rely upon electronic packages from commercial and society publishers (i.e., Safari, SPIE, Knovel, AIAA, IEEE, AGU, AIP) and do not want to devote staff time to individual book processing. Security is a concern. While all NASA pictures and data eventually become publically available, the design work supplied by civil servants and contractors is proprietary. The campus has a public affairs office that handles Twitter, Facebook, Instagram, and other social media sites. FOIA (Freedom of Information Act) requests are frequent and also handled by this office. Staff must get ITAR (International Traffic in Arms Regulations) approval before presenting or publishing (including this author).

Public services librarians are kept busy with reference questions via phone and e-mail -- chat is not used due to security issues. They conduct instruction sessions for groups, such as summer interns, and hold several outreach programs: Goddard Day Science Jamboree (for the public) and Digital Research Day (vendors give presentations). Sample brochures highlight databases for summer interns and advertise the University of Maryland borrowing program. A coffee machine in the library is welcoming. Because there is a cafeteria downstairs, the library doesn't offer food; however, customers are welcome to bring their lunch to the library to eat while reading or studying.

Right outside the front door is a series of large posters highlighting the library's value to patrons -- defining the library as: 1) access to resources you need, 2) your publications all in one place, 3) someone to do your literature review, and 4) colloquia videos past and present. A changing sign lists the division with the most publications and the journal with the highest citations. The library had a mobile librarian program in buildings furthest from the library, in a successful effort to take library services to remote users (Reynolds-Pope et al. 2010). The service offered research consultations, book drop-off and delivery, interlibrary loan, and in-depth demonstrations to groups. While succeeding in increasing reference questions by 11% compared to the previous year this program was unfortunately later cut due to budget reductions (Personal Interview 2013).

In 2014 the library director reported to me on new developments to the library. A team of interested stakeholders were examining what to do with the space. While book circulation was strong at 500 books per month or 5,000 books in circulation at any one time, foot traffic into the library had notably decreased. Other divisions in Goddard were eyeing the library space for other purposes. The team recommended a new state-of-the-art Information Center and Collaboration Center, to be called The Goddard Information and Collaboration Center or GIC^2. The Information Center would be next to the stacks with a separate entrance door and be divided from the Collaboration Center with glass or a movable partition. The book collection is being reduced by about one third to fit in the smaller space. The Collaboration Center would be flexible space with white boards, telecommunications equipment, projectors, seating, and a kitchenette so it would serve a number of purposes -- lectures by interns and scientists, evening receptions, award ceremonies, and training sessions, for which there is much demand by various divisions. Smaller rooms would be created for smaller collaborative groups. More areas of the library would also be made compliant to accessibility codes (Phone Interview 2014).

Interviews with Scientists

I conducted interviews with seven scientists, asking questions relating to the research process: how they found information, used the library, managed their citations, and their approach to data management plans. This sample seems small, but since 2001 at Cornell I have interviewed over 70 engineering faculty in their offices, collecting information on their research habits, and this additional knowledge contributes to my summary composites and comparisons.

As I interviewed the scientists, their patterns of researching the literature appeared to differ along generational lines. According to Zemke's *Generations at Work*, Baby Boomers were born 1943-1960 and came of age in the 1960s and 1970s (Zemke et al. 2000). Generation Xers were born 1960-1980 and came of age in the 1980s-1990s. Generation Yers, also called the Millennials, were born 1980-2004 and came of age in the 1990s-2000s (Zemke et al. 2000). These date ranges may be cited slightly differently elsewhere, but Zemke researched people's values and views to arrive at these dates.

The NASA scientists I interviewed represented all three generation types, but I do not give the breakdown by group to preserve confidentiality. The patterns noted are generalizations and not every individual exhibits these characteristics, but they are still worth discussing and could potentially inform us how to best serve our user population across generations.

Baby Boomer

The Boomers interviewed had around 20 library books in their offices, which were in some cases overdue. Most did not use e-books, but made extensive use of online journal articles. While some used Web of Science often, others used it rarely and only because someone asked them to sign up for Researcher ID and get an H-index. Boomers are traditional library users, wanting to browse the physical books, do interlibrary loan, and visit the nearby University of Maryland library when needed. They are well-established scientists, knowing everyone in the field and the older boomers do not typically conduct literature searches. Citation management consists of copying/pasting. They rely upon information technology staff to handle data management. This research behavior is similar to established Boomers interviewed by me at Cornell, except that the Cornell researchers used graduate assistants to perform database searches.

Generation X

The Generation X scientists used online journal articles and e-books even though they preferred print books. Their work was sometimes hindered by technical issues surrounding e-books -- they had trouble displaying, downloading, printing, and authenticating, but usually did not notify staff, who could probably resolve the issues. Technology and bureaucracy appeared to be roadblocks for them in the research process. Because of sequestration the NASA travel office instituted extra paperwork for travel. As a result an Xer was skipping a conference even though he had a paper accepted. He felt the extra work was too onerous. Many use Google Scholar primarily for searching and BibTeX and LaTeX for citation management. One felt strongly about the importance of data management, and emphasized this in his reviews of other papers. He was also concerned about the younger scientists (Generation Y). They were asked to do a lot of outreach work and this took up time when they should be doing more publishing. He warned that those who don't publish enough risk not getting permanent positions. This pattern of research behavior (using e-journals and e-books, but preferring print books) is similar to established Xers interviewed at Cornell.

Generation Y

These scientists were the most advanced technically. Their offices were minimally filled in comparison to their elder colleagues as they managed most of their research online. Reading articles and books, reviewing, writing, collaborating -- all of these tasks were performed online. Their print book collections numbered under a dozen. They did not have complaints

about technical issues accessing library resources -- either they knew the answer, consulted a lab mate, or looked up the solutions to problems on Google. They continued to attend conferences and did not appear bothered by the increased paperwork required by NASA to travel.

Their e-book use included not only academic books, but also online popular reading books for Kindles, iPads, etc. They were concerned about data management, and recopied data to new physical formats every five to ten years for preservation. They did not hesitate to sign up for new tools. While showing them a journal table of contents service, one person set up a userid and password within seconds and without hesitation. They all used citation managers, with Papers being popular (one senior member purchased Papers for everyone in the same lab). Cornell Gen Ys also exhibit these research habits, using other citation managers such as RefWorks, Mendeley, Endnote, and Zotero as well as Papers successfully in their research workflow.

Interns

The 60 NASA high school and college interns held a poster session detailing their summer work. In speaking with them as they stood by their posters, most mentioned attending the library orientation session. Some went to the library for programming books and reference manuals (or borrowed books from a mentor or colleague). Despite the large number of databases available through the library (IEEE Xplore, SPIE, AIAA, etc), the college interns found it easier to utilize their home institution's online resources, such as SciFinder. One intern mentioned using her personal American Chemical Society (ACS) login as it was easier to search and retrieve journal articles than in SciFinder. One poster, which had a large number of references, was done by a student who mentioned using Web of Science and ScienceDirect for her research.

Summary

Like many technical libraries, the NASA library at Goddard is moving from print to online by acquiring more digital library collections from publishers and engineering societies. They have responded to budget cuts by reducing staff, public hours (open afternoons only), and concentrating on digital projects. In particular, the library repository is rich in content, coverage, and capabilities. They prepare for fiscal changes by doing scenario-based budgeting, such as planning for a possible 25% reduction in collections that may or may not occur. They publicize their services with a variety of methods from brochures to signs to instruction sessions, research days, and when possible, staffed a weekly mobile librarian in remote buildings on campus. They have a blog, Facebook, web site, and contribute to other social media sites. Their coffee machine attracts more in-person visitors. They were fortunate to have scientists who successfully lobbied for the library's reopening.

The library users interviewed exhibit common research habits along generational lines. Baby Boomers use some technology, notably e-journals, but prefer print books and browsing physical libraries. Their work and life experience are invaluable to the younger generations and they serve as advisors, reviewers, mentors, and co-authors. Their research networks are large and productive. Generation Xers embrace technology, but not always eagerly and tend to get bogged down by technical issues, many of which could be resolved if staff are notified and as software improves. Generation Xers are a transition generation, straddling the print and online worlds, so the transition to online may be more difficult for them. They are regular users of the print collection and are advocates for the physical library. They also have established research programs, networks, and are good mentors. Often Generation Y has the most to teach us about the latest methods of online research, having grown up with computers. They don't view computers as technology but as an assumed part of life. Nationally 73% of students are more likely to use the Internet than go to the library (Oblinger 2003). Almost all use a citation manager. They are less interested in the physical library and visualize it as a lecture room,

computer training room, social area, or coffee shop. They use online databases and resources regularly and are frequently asked to help Gen Xers and Boomers when they have technical problems. Their strengths "include multitasking, goal orientation, positive attitudes, and a collaborative style" (Oblinger 2003).

What should librarians do with this information? First, recognize the different generations and listen to their unique approach to research. Some need more assistance than others, but all share the common goal of wanting to find a resource in the quickest amount of time. We should route technical questions to trained staff to quickly assist so as to minimize disruption to their research process. We should regularly train more staff to learn these technical skills and realize technical problems can be major obstacles. We should give feedback to publishers and aggregators for more intuitive software to online resources. By observing and learning from what Gen Yers have to teach about technology, we can develop new tools, such as a virtual shelf browser for those who miss the physical browsability in the stacks. And last, we can share the excitement of knowledge and research with all the generations.

References

James Webb Space Telescope. [Internet]. [Cited 2014 May 6]. Greenbelt (MD): NASA Goddard Space Flight Center. Available from: http://www.jwst.nasa.gov/

NASA Centers and Facilities Map. [Internet]. [Updated 2014 March 17] Greenbelt (MD): NASA Goddard Space Flight Center. Available from: http://www.nasa.gov/about/sites/

NASA Goddard Facilities. [Internet]. [Updated 2013 September 30]. Greenbelt (MD): NASA Goddard Space Flight Center. Available from: http://www.nasa.gov/centers/goddard/home/installations.html

NASA Goddard Space Flight Center. [Internet]. [Updated 2013 September 30]. Greenbelt (MD): NASA Goddard Space Flight Center. Available from: http://www.nasa.gov/centers/goddard/about/

NASA Visible Earth. [Internet]. [Updated 2014 May 6]. Greenbelt (MD): NASA Goddard Space Flight Center. Available from: http://visibleearth.nasa.gov

Oblinger D. 2003. Boomers & Gen-Xers Millennials: Understanding the New Students. *Educause Review* [Internet] [cited 2014 February 17];(July/August):38-39. Available from: http://www.educause.edu/ir/library/pdf/ERM0342.pdf

Personal Interview with Goddard library staff. 2013 July 2-3. Greenbelt, MD.

Phone Interview with Robin Dixon. 2014 March 26.

Reynolds-Pope, T., Chesnes, M. and Early, C. 2010. The Mobile Librarian Program at the NASA Goddard Space Flight Center. *Science & Technology Libraries* [Internet]. [cited 2014 Feb 17] 29(4):267-279. Available from: http://www.tandfonline.com/doi/abs/10.1080/0194262X.2010.523312.

Zemke, R., Raines, C. and Filipczak, B. 2000. Generations at Work: Managing the Clash of Veterans, Boomers, Xers, and Nexters in Your Workplace. *AMACOM* Div American Mgmt Assn. Retrieved from Books24x7. p. 280. Available from: http://books.google.com/books?id=HzrAtfn6jXMC&pgis=1

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