

THE GREEN ARCHIVIST: A PRIMER FOR ADOPTING AFFORDABLE, ENVIRONMENTALLY SUSTAINABLE, AND SOCIALY RESPONSIBLE ARCHIVAL MANAGEMENT PRACTICES

BY HEIDI N. ABBEY

ABSTRACT: In the past forty years, research and publications in the library science and museum studies fields have illuminated the growing imperative of adopting green practices in cultural, educational, and public heritage institutions in the United States. These initiatives are part of a much broader and global issue known as environmental sustainability, or meeting the economic, environmental, social, and cultural needs of the present without compromising the same needs of future generations. Numerous books, articles, and professional organizations currently advocate for sustainable library and museum services and facilities, including green building construction and management, and ecologically-sensitive business operations. However, within the field of archival science, investigations have concentrated on facilities design and environmental control rather than on a holistic approach promoting simple, attainable, green initiatives that archivists can readily implement. This article examines the state of scholarship in these arenas and is further intended to broaden the scope of the green discussion within the archives community. It also offers a pragmatic framework of strategies and resources needed to incorporate more affordable, sustainable, and socially responsible archival management practices into the profession.

Introduction: Archivists and Sustainability

Archivists have long been progressive stewards of our society's cultural and intellectual heritage. As curators of artifacts, ephemera, manuscripts, records, and digital assets in various formats, archivists are deeply rooted in the theory and practice of preservation and care for the long-term needs of primary resources in their custody. The process of facilitating the survival, or sustainability, of the cultural record is at the very heart of what archivists do. It is a vital part of the *raison d'être* of archival science. Archivists are thus naturally accustomed to thinking, throughout the archival

management lifecycle, about the impact that their decisions will have upon the resources, people, and communities they serve now and in the future.

An integral aspect of this life cycle involves maintaining proper facilities and providing for consistent environmental controls to mitigate damage from lighting systems, and, most especially, rapid cycling, or fluctuations in temperature and humidity conditions. These factors, in turn, greatly affect outcomes for the short- and long-term preservation of primary resource collections. Considerable research has been published to guide archivists in planning new facilities and remodeling existing buildings and to ensure for the proper care of collections in accordance with established preservation guidelines.¹ However, managing buildings and their operational control systems is a complex and costly endeavor that puts a tremendous strain upon natural resources, including ever-increasing demands for energy sources. In fact, according to a recent study from the U. S. Energy Information Administration, buildings and their operations required the use of fossil fuels that consumed as much energy as the industry and transportation sectors combined and contributed almost half of the carbon emissions and greenhouse gases that are linked to global climate changes.²

Considering the financial and ecological impact of caring for primary resources on a global scale, it seems a worthwhile endeavor and in keeping with the basic tenants of the archival profession to consider the leadership role that archivists can fulfill with regard to these environmental issues. This article was inspired by the desire to explore this objective in greater detail, particularly after a review of the literature from both the library science and museum studies fields yielded extensive research on green strategies and best practices in libraries and museums—but not in archives. To be sure, over the past four decades, numerous cultural, educational, and public heritage organizations have increasingly embraced practices that are part of a much wider issue known as environmental sustainability, or meeting the social, environmental, economic, and cultural needs of the present without compromising the same needs of future generations. Numerous books, articles, and professional organizations have been advocating for the ongoing development of the “green library movement”³ and “green museum movement,”⁴ both of which champion sustainable facilities and services such as green building construction and management and ecologically-sensitive business operations.

However, within the field of archival science, research has concentrated on facilities design⁵ and environmental control rather than on taking a holistic approach and promoting simple, attainable, green initiatives that archivists can readily implement in their repositories.⁶ It could be argued that the existing body of guidelines developed by libraries and museums can be applied easily to the world of archives. Yet, while the professions are indeed allied, they are distinctly different. This perhaps calls for a separate sustainability framework and unique tools for archivists that are informed by and adapted from current best practices.

Aside from the limited scholarship on sustainability in archives, research for this article was further prompted by the adoption of the “Core Values of Archivists” by the Society of American Archivists (SAA) in May 2011, and greatly influenced by the recent work of author and museum studies scholar, Sarah Brophy. First, the language in SAA’s “Core Values” document now includes a statement on social responsibility. This guiding principle serves as a reminder that archivists place a high value upon

cultural heritage because it documents our collective memory, and that “underlying all of the professional activities of archivists is their responsibility to a variety of groups in society and to the public good.”⁷ When considered in conjunction with SAA’s “Code of Ethics,” which defines guidelines about professional relationships, judgment, authenticity, security and protection, access and use, privacy, and trust, the “Core Values” delineate the day-to-day activities of the profession. Second, incorporating social responsibility into this framework unites archivists with environmental sustainability because, as Sarah Brophy, co-author of *The Green Museum*, states, “Environmental sustainability is all about the public good. Environmentally-sustainable practices keep our institutions in sync with our communities’ needs and concerns even as we fulfill our professional practice.”⁸

The remainder of this article will summarize more of the work of Brophy and others on the history of sustainability within the context of the American environmental movement and will offer a discussion about research on the green library and green museum movements to date. This can subsequently be used as a basis for continuing the dialogue about sustainability in the archives community. It concludes with recommended strategies and resources that may be used to build a pragmatic framework for incorporating more affordable and socially responsible archival management practices into the profession.

Literature Review: Sustainability in Libraries, Museums, and Archives

Definitions and Context

Before discussing sustainable practices in libraries, museums, and archives, it is essential to define the terms “sustainability” and “green” as used throughout this article. They are often referenced interchangeably. Both concepts embrace worldwide ecological awareness that has become ubiquitous in contemporary American society. The environmentalist Dr. Sonya Newenhouse, founder of the Madison Environmental Group in Wisconsin, defines sustainability as “...living a beautiful, meaningful life that respects people and leaves the planet a better place for the generations that follow.”⁹ This is a very simple and broad definition, approachable for the layman and expert alike.

However, the most frequently-cited and earliest definition of sustainability was first used in the 1987 report, “Our Common Future,” by the United Nations’ World Commission on Environment and Development (WCED). Chaired by Former Prime Minister of Norway Gro Harlem Brundtland, the WCED is more commonly referred to as the “Brundtland Commission.” It described sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹⁰ This definition is intrinsically linked to the human experience and the natural environment and has been applied within numerous industries and fields of study, including agriculture, architecture, business, ecology, engineering, economic development, design, forestry, manufacturing, and tourism.

Furthermore, sustainability is commonly parsed into three ideological pillars: social, environmental, and economic. This tripartite aspect of sustainability is often referred to as the “triple bottom line,”¹¹ “TBL,” or “3BL,” and advocates for businesses and other organizations to function in a way that considers positive outcomes for “people, planet, and profit.”¹² For an organization to conduct its affairs in a sustainable manner, success must be measured against not only income, but also against impact upon a community, or society at large, and the natural environment.

Within the sustainability literature, the term “green” also appears regularly. In general, it describes numerous products and behaviors that do not harm the environment. The term “sustainability” is more holistic and encompasses green practices and processes.¹³ Thus, being green is part of sustainability and involves reducing the consumption of non-renewable resources, reusing materials, and recycling. With this cursory understanding of sustainability and greener approaches to development, it is now possible to view the evolution of sustainable libraries, museums, and archives within a much broader context.

From Greener Living to Greener Libraries

Environmental sustainability, green business practices, and eco-friendly processes are not twenty-first century phenomena. These concepts have their roots in the American environmental movement,¹⁴ which began in the early nineteenth-century. The work of well-known naturalists and writers, such as John Muir (1838-1913) and Henry David Thoreau (1817-1862), ushered in the first wave of environmentalism, which focused on natural resource conservation and man’s responsibility to nature. By the mid-twentieth century, the second wave of environmentalism took hold and is exemplified by the book *Silent Spring*, written by noted biologist Rachel Carson. Released in 1962, the book highlighted the indiscriminate use of the agricultural insecticide DDT and its long-term effects on birds, people, and ecosystems. In June 1969, Americans witnessed the burning of the Cuyahoga River in Cleveland, Ohio, which became a symbol of the nation’s water and air pollution problems. On April 22, 1970, the first Earth Day was celebrated, and several months later, the establishment of the U.S. Environmental Protection Agency brought 1970, the “year of the environment,”¹⁵ to a close. Widespread litigation, legislation, regulations, and militant activism were commonplace during the 1970s and mid-1980s, leading up to the third wave of the environmental movement in the United States that has been characterized by a desire to move beyond exposing society’s environmental problems and to focus instead on finding solutions for them.

These pivotal events have contributed towards an ever-growing eco-consciousness that is now closely intertwined with greener living as a whole. Responsible environmental stewardship practices exist for everything from architecture, agriculture, and business, to the hotel and convention industries and trade show exhibit design and construction. Advice on adhering to a green lifestyle bombards American consumers on their trips to the grocery store or local bookshop. For example, there are numerous popular magazines dedicated to living sustainably, such as *Kiwi: Growing Families the Natural and Organic Way*, Martha Stewart’s *Whole Living*, and *Mother Earth News: The Original Guide to Living Wisely*, which has been published continuously in the U.S. since 1970. In terms of earth-friendly products, the green consumer has more choices

now than ever before. It is possible to buy everything from a jar of gluten-free, soy-free, dairy-free, certified organic mustard packaged in recycled plastic to a mattress made from locally-sourced wool and organic cotton. Given the expanding green marketplace and the power of the modern consumer to demand environmentally-friendly, fair trade, non-genetically-modified foods and other goods, it is not surprising that concern about the “triple bottom line” and greener business practices eventually took hold in cultural heritage institutions such as libraries and museums.

“The Green Library Movement”

After examining the library and museum studies literature spanning the past four decades, it is evident that the library community took the lead in thinking green and putting sustainability theories into practice. Beginning in the late 1960s, two professional library organizations, the Special Libraries Association (SLA) and the American Library Association (ALA), responded to concerns about widespread misuse of natural resources and pollution in the United States. SLA led the way as early as 1968 with the formation of the SLA Natural Resources Division, and, in 1976, with the SLA Environmental Information Division.¹⁶ Within ALA, the Social Responsibilities Round Table created the Task Force on the Environment (TFOE) in 1989. TFOE was established for the purpose of advocating for environmental sustainability issues and awareness within the profession.¹⁷ The Library Leadership & Management Association division within ALA has also been a strong advocate for sustainable libraries, from fundraising to facilities design, since the 1990s.¹⁸

However, comprehensive literature reviews about green libraries were not published until Monika Antonelli’s work appeared in the *Electronic Green Journal* in 2008,¹⁹ and, more recently, Maria A. Jankowska and James W. Marcum’s research was published in *College & Research Libraries* in 2010.²⁰ The authors’ findings in each of these studies confirm that the growing ecological awareness among librarians started to emerge in the library literature of the early 1990s. In “The Green Library Movement: An Overview and Beyond,” Antonelli credits the *Wilson Library Bulletin* for publishing, as early as February 1991, articles centered on the topic of “Libraries and the Environment.” In this special issue, authors James and Suzanne LaRue wrote perhaps the first article dedicated to eco-librarianship, “The Green Librarian.” It specifically discusses and was clearly influenced by the controversial “Gaia hypothesis,”²¹ which was introduced in 1979 by British environmentalist and scientist James Lovelock. In *Gaia: A New Look at Life on Earth*, Lovelock purported that the Earth is a “...carefully interconnected, self-regulating cybernetic ‘super organism’ in which life creates and maintains the condition for life,”²² and, accordingly, promoted the urgency of addressing environmental and resource conservation issues. Consequently, “The Green Librarian” reads like a manifesto for those aspiring to become green librarians in both personal and professional capacities, complete with advice that is still relevant today:

At home, Green Librarians take steps to cut back on their trash....They use cloth or paper bags instead of plastic bags. They bicycle or walk or take the bus or carpool to work....At work, Green Librarians seek and use ecologically sound alternatives to many common, wasteful, and/or dangerous products. They try to improve the ‘health’ of the buildings

where they work....Some Green Librarians specialize in providing information to others about ecological concerns.²³

Antonelli's analysis of green library initiatives of the 1990s and 2000s provides a basis for understanding just how far the library community has evolved as a sustainability leader. Her ideas are further expanded upon in Jankowska and Marcum's work "Sustainability Challenge for Academic Libraries: Planning for the Future" in *College & Research Libraries*, which focuses on environmental stewardship for the academic library community. Their review of the library literature categorizes research on the green library movement into four distinct topics: sustainability of scholarly communication, including digital and print collections; green library operations and practices; green library facilities; and, finally, measuring and improving sustainability.²⁴ Jankowska and Marcum argue not only for greener library spaces, but also for greener library strategies that integrate ecologically-friendly practices into a "platform for guiding future decisions about collections, library buildings, and the scale of preservation, digitalization, equipment, products, and library networking service efforts."²⁵ Additionally, Jankowska and Marcum's work stresses the importance of recognizing libraries as "environmental consumers."²⁶ They elaborate upon the amount of waste generated and natural resources consumed by library buildings, staff, and patrons every day. Reducing, reusing, and recycling alone do not reduce a library's ecological impact. Instead, Jankowska and Marcum call for strategies that outline indicators and metrics to address the three common pillars of sustainability—society, environment, and economy. The authors argue that data from such analysis could then be used to determine a library's ecological footprint, which in turn provide a basis for decisions about future operations and services, planning, and organizational sustainability.

The aforementioned comprehensive literature reviews aside, scholarship on ecologically-sensitive librarianship continued to appear regularly in prominent magazines and journals for the field throughout the first two decades of the twenty-first century. Numerous articles on green librarianship and the construction of Earth-friendly library buildings were published in *College & Research Libraries News*, *American Libraries*, and, especially, in *Library Journal*²⁷ between 2001 and 2010. The year 2008²⁸ was a particularly seminal one for environmental sustainability in the library literature as there was a notable surge of articles about green facilities and library operations in these publications.²⁹ Most recently, the topic of eco-friendly librarianship has expanded even further to include greener collection development practices and passive solar designs for facilities.³⁰

A shift from short articles to entire books took place in 2009 when Sam McBane Mulford and Ned A. Himmel published the first extensive, green librarianship primer, *How Green is My Library?* In the spring of 2010, Kathryn Miller authored the first green public librarianship guidebook, *Public Libraries Going Green*. These publications are perhaps reflections of the demand for more solution-oriented and comprehensive resources on this ever-expanding topic, and, indeed, a maturation of the green library movement.

Mulford and Himmel's book is written for librarians and library staff, public administrators, facilities managers, and anyone else who wishes to embrace being green. It offers readers a guide that is both practical yet extensive in scope. The book also

provides an introduction to terms commonly used in the sustainability literature, such as “alternative energy,” “ecological footprint,” “LEED” (Leadership in Energy and Environmental Design), and “renewable energies.”³¹ One of the most useful sections in *How Green is My Library?* is the “Preliminary Green Assessment Checklist,”³² which serves as an introduction to embracing greener library practices. The checklist can measure and assess how well a library adheres to environmentally-friendly standards and best practices, including water and energy efficiency, use of sustainable materials and resources, improved indoor air quality, and innovations in operations and design. Another valuable contribution in the book is the detailed explanation of the LEED Rating System and certification program. LEED was created in 2000 by the U.S. Green Building Council and serves as a benchmark for designing, constructing and/or renovating, and maintaining green buildings. It consists of requirements and a points system that are used to establish whether a building meets specific criteria.

The last section of *How Green is My Library?* includes a range of pragmatic, cost-effective suggestions on applying green methods every day such as: adopting sustainable horticulture and integrated pest management practices for a library’s site and landscaping; living closer to work and/or supporting alternative transportation like carpooling or ridesharing; using less plastic; buying eco-friendly hardware; buying locally and buying in bulk; reducing, reusing, and recycling whenever possible; and engaging with teachers and activists in the library’s community to promote sustainability awareness through educational programming. The authors present numerous ideas, some of which are simple and inexpensive, while others like LEED certification require considerable time, expertise, and funding.

Following the release of Mulford and Himmel’s book, Kathryn Miller’s *Public Libraries Going Green* specifically targets an audience of public libraries. It contains a wealth of practical information such as the codes established by the Society of the Plastics Industry that are essential for determining recyclable plastics. Miller’s work also promotes the public library as a potential environmental leader and educator.³³ In fulfilling the public library’s role as a green teacher, Miller references the report “Environmental Literacy in America,”³⁴ which was issued in 2005 by the National Environmental Education & Training Foundation (NEETF). The report outlines goals to increase environmental literacy throughout the U. S. and sheds new light on the lack of comprehensive environmental knowledge and programming in our country. According to the report, 80 percent of Americans surveyed were still influenced by incorrect or invalid environmental myths; and just 12 percent of Americans could successfully answer a quiz that measured awareness about energy issues.³⁵ These sobering statistics serve as a wake-up call that more work and education are needed to create a culture of environmental sustainability. Thus, Miller advocates for public libraries to contribute to environmental literacy goals by using the age-old concept of leading by example: make the library a green space, provide green services, and teach about green topics.

“The Green Museum Movement”

Over the past forty years, libraries throughout the U.S. have not been working alone as ambassadors for environmental sustainability. Many progressive museum professionals concerned about diminishing natural resources and declining biodiversity started

to propel a different green movement in the 1970s. However, unlike the thorough documentation on the green library movement, a comprehensive literature review about museums and environmental sustainability in America does not yet exist.³⁶ The following is an overview of the discussion in the museum studies literature.

While the library profession was an early proponent of environmental activism and education during the late 1960s, cultural heritage experts did not start to build a foundation for their own green revolution until decades later. Furthermore, professional museum organizations, such as the American Alliance of Museums (AAM, formerly known as the American Association of Museums) and the Association of Zoos and Aquariums (AZA), did not take the lead in eco-awareness initiatives. Instead, it is widely accepted that practical efforts to go green in America began within zoological organizations and children's museums.³⁷ This is not surprising, given the ecological advocacy and wildlife conservation role that zoos typically serve and the educational mission that all museums aim to fulfill. Also, children's museums have health and safety imperatives to protect their youngest and most vulnerable visitors from pesticides, indoor air pollutants, and other harmful chemicals.

One of the earliest examples of efforts to embrace environmental sustainability and educate the public about recycling was a creative program for children known as "The Recycle Shop." Developed by the Boston Children's Museum in 1970,³⁸ this part of the museum featured donated materials from local manufacturers that would otherwise have found their way into a landfill. For a few dollars, museum visitors could fill a bag with recycled items to be used later in arts and crafts projects. The program has been wildly popular with children, parents, and teachers for forty years and illustrates the fact that museums can promote environmental awareness in a way that is simultaneously educational, positive, and fun.

In addition to programming exemplified by The Recycle Shop, discussions about ecological problems, social responsibility, and the pivotal role that cultural institutions can fill were first mentioned by museum theorists in the early 1970s.³⁹ However, it was not until twenty years later that the term "sustainability" formally appeared in professional museum publications in the United States. To understand this development, it is important to realize that the 1990s were marked by extreme self-reflection among public heritage organizations, with new ideas and questions about the culture, history, identity, theory, and politics of museums—a new museology⁴⁰—and a strong movement away from object-centered practices towards more user-focused services and collections. This has been described by noted museum studies scholar Stephen E. Weil as a paradigm shift. Weil wrote prolifically about the future of museums and the "inseparability of the museum's interpretive and exhibition functions."⁴¹ He argued that museums should focus on three, key institutional responsibilities, including preservation, research and study, and communication through interpretation and exhibition.

Amidst this theoretical paradigm shift in the 1990s, museum studies scholars began to address growing concerns about proactive engagement with social issues and community needs. This may have been part of the growing trend towards environmental sustainability worldwide. But it also may have been influenced by UNESCO's pivotal publication, "Our Creative Diversity: Report of the World Commission on Culture and Development,"⁴² which was released in 1995. The report called for an expansion of the

social, environmental, and economic sustainability factors discussed previously, and included a vital fourth factor consisting of cultural values and beliefs that ultimately influence whether or not society will develop, protect, and manage resources in a sustainable way. Two examples of this emerging trend in the museum studies literature were published by Tereza C. Schenier⁴³ in 1997 and Douglas Worts⁴⁴ in 1998. Both authors strongly advocated for museum professionals to incorporate sustainable development into their institution's identity in order to remain relevant into the next century.

During the first decade of the twenty-first century, Worts and other museum studies scholars, such as Sarah S. Brophy, Elizabeth Wylie, and Glenn C. Sutter,⁴⁵ contributed significantly to the body of research on sustainability topics and propelled the green museum movement forward. Their work and that of other green museum pioneers resulted in the publication of numerous articles on how to build environmentally-friendly facilities and how to include socially-responsible practices in day-to-day museum operations. Green museums were a popular topic in notable sources like *Hand to Hand: Association of Children's Museum Quarterly*,⁴⁶ *Museum News*,⁴⁷ and *Museums & Social Issues: A Journal of Reflective Discourse*.⁴⁸

Developing concurrently with the above publications, professional organizations such as the AAM, the AZA, and the California Association of Museums (CAM) launched initiatives to create best green practices, including national conferences featuring green sessions and presentations, listservs, and special interest groups to further the ongoing development and application of sustainability projects within museums. For example, as early as 2002, the AZA established Green SAG, the "Green Practices Scientific Advisory Group,"⁴⁹ which has an active "Green Practices Listserv" that focuses on reducing an individual's or an organization's environmental footprint. In 2006, CAM established itself as an early sustainability ambassador for the museum profession by creating the "Green Museums Initiative" and corresponding committee to "inspire California museums to develop green business practices, eco-friendly facility management, and sustainable programming."⁵⁰

In 2008, paralleling the publication trends revealed in the literature review of the green library movement, discussions about ecologically-friendly museum practices moved from the realm of articles and dialogues to the first, comprehensive book on the topic of museum sustainability, *The Green Museum: A Primer on Environmental Practice*. Co-authored by green museum gurus Sarah S. Brophy and Elizabeth Wylie, *The Green Museum* provides a thorough introduction to green practices for the profession. The book addresses sustainability concepts, green metrics such as energy audits and LEED certification, green education, and a selection of funding sources for green initiatives. To discourage readers from feeling overwhelmed by the complexity of going green, Brophy and Wylie in the "Afterword" end their green primer on a positive note by sharing, in the spirit of collaboration, the following expert and candid advice:

Practicing environmental sustainability is complicated, evolving, and conditional. *Complication* comes from the omnipresence of the environment: one part affects another, and another, and another. That is why synergy... is so important. *Evolving* comes from increased demand and improved ability to respond to that demand. Not only are there more solutions, but there are more choices within solutions. *Conditional* is

because each museum, and each site, is different. Much of what you decide will depend upon your particular environment. That is why it is so important to embrace the evolutionary process, and to share our knowledge and experience to help one another (not just among museums but in our local, regional, national, and global communities).⁵¹

Considering the pace with which the environmental sustainability field is evolving, information and resources found in *The Green Museum* are complemented by Sarah Brophy's "Green Museums Wiki" (<http://greenmuseums.wetpaint.com/>), created in 2008, and the "Sustainable Museums Blog" (<http://sustainablemuseums.blogspot.com/>), which was first launched in 2010. A thought-provoking and popular post on Brophy's "Sustainable Museums Blog" from May 18, 2010, concerns the ideological components of sustainability and how they can be reframed for the museum community as the "quadruple bottom line"⁵² or "QBL." In her post, Brophy astutely draws a valuable comparison between the four tenants of sustainability—social, environmental, economic, and cultural—and the modified tenants of sustainability as applied in a cultural heritage organization—people, planet, profit, and program. In other words, for a museum to operate in an environmentally sustainable way, success must always be gauged against the impact upon and consideration for human, natural, and fiscal resources, as well as whether or not decisions support or impede the primary mission, values, and programming of the institution. A simpler way of expressing this is: People plus planet plus profit plus program equals progress towards defined sustainability objectives.

With regard to Brophy's comments on the importance of mission and values in the sustainability equation, nothing is more central to the educational mission of a museum than exhibitions and other forms of outreach. Libraries and archives often develop exhibits as well, but not to the extent typically seen in the museum community. This is a distinctive aspect of the green museum movement that warrants additional discussion because the exhibit life cycle has an enormous ecological impact. Consider, for example, all of the materials traditionally used in the development and assembly of a single museum exhibit: glues, plastics, paints, synthetic floor coverings, and pressure-treated wood are but a few. Many of these items are highly toxic for people, especially children, the elderly, and museum employees in close contact with them every day. They are damaging to the planet too, as they "off gas," or emit harmful chemicals into the air. They are wasteful if discarded, and consequently contribute to overflowing landfills across the country.

Extensive research and the development of best practices on green exhibits have been undertaken most notably by the Madison Children's Museum in Madison, Wisconsin. An early leader in the field of museum sustainability since 1998, the museum created the Web site Greenexhibits.org in 2005 to "provide museum exhibit designers and fabricators a resource for designing and building exhibits and environments that best support healthy spaces and a healthier future for kids and the environment."⁵³ The Web site includes a green checklist that can be used throughout the life cycle of an exhibition with the principal goals of reducing or eliminating toxins and waste.

Building upon the work of the Madison Children's Museum, the Oregon Museum of Science and Industry (OMSI), located in Portland, Oregon, created a much-needed

industry tool that rates an exhibit's environmental sustainability. Launched in June 2008 and known as the "Green Exhibit Certification" tool,⁵⁴ the OMSI model was influenced heavily by the LEED rating and certification system used in the green building industry. Like LEED, the OMSI model comprises a checklist and points and rating system. However, OMSI is used to benchmark eight different exhibition design elements, including: the use of renewable materials; the potential for reuse of materials; the extent of recycled materials used; an end-life assessment, or a determination of materials that can be either reused or recycled; the use of low-emitting materials to reduce the impact of volatile organic compounds (VOCs) that negatively affect the environment and indoor air quality; the use of wood that is certified by the Forest Stewardship Council, also known as "waste neutral" wood products; the incorporation of energy efficiencies and conservation; and the use of regional or locally-sourced materials.

Although the extent to which museums use the "Green Exhibit Certification" checklist is currently unclear, OMSI has been making progress towards advocating for its widespread adoption and implementation throughout the museum profession. For example, in September 2009, OMSI was awarded a \$2.3 million dollar grant from the National Science Foundation, "Promoting Sustainable Decision Making in Informal Education,"⁵⁵ which will fund a public exhibition on the topic of sustainable living as well as the ongoing development of the "Green Exhibit Certification" tool that is now referred to as the "Green Exhibit Checklist (GEC), Version II." The five-year grant will enable OMSI to revise and re-launch the tool and current website, "exhibitSEED,"⁵⁶ as well as host GEC workshops across the country for museum professionals interested in learning how to use the model to create more sustainable exhibitions. To encourage feedback from leading sustainability experts in the science and public heritage communities, and to pursue adoption of the model as a museum industry standard, OMSI is collaborating with numerous organizations and industry experts, such as the AAM, the Association of Children's Museums, and the Association of Science-Technology Centers.⁵⁷

Beyond Green Libraries and Museums: Green Archives?

The previous literature reviews offer an examination of the American green library and green museum movements, which followed similar historical trajectories in that they both originated in the "year of the environment" in 1970. Both seem to have reached a peak in popularity around 2008, when a concentration of articles were published in magazines and journals, followed shortly thereafter by books for each respective profession. This literature of the library and museum fields is instrumental in highlighting our collective understanding of environmental sustainability, both in theory and in practice. The resources available about this topic are extensive. They are complicated and interdisciplinary in scope, reflecting an integration of knowledge, information, and perspectives that derive from and are shaped by various intellectual spheres, including the business, economic, and industry sectors (e.g., "triple bottom line," assessment, and metrics), the environmental and resource sciences (e.g., biodiversity, conservation, ecology, energy, global warming, pollution, waste management), and the humanities and social sciences (e.g., cultural and public heritage institutions such

as libraries, museums, and the education field). A synthesis of key findings from these green movements confirms that libraries and museums are significant environmental consumers because of their energy-draining facilities, and the creation of resource-intensive exhibitions that generate unnecessary waste and harmful pollutants. Both communities, however, have been making significant strides to improve their sustainability efforts since the 1970s, and, in essence, take on new roles as environmental educators and leaders in the 1990s and 2000s.

Missing from these discussions, however, is another vital link to the sustainability of our cultural heritage: archival repositories, the primary sources that are contained within them, and the archivists who steward them. Similar to libraries and museums, archives strive to facilitate access to and preserve physical and intellectual resources; educate and positively engage with diverse user groups and stakeholders via exhibitions and other outreach programs; uphold intellectual freedoms; and operate within a framework of ethical and socially-responsible guidelines. Archives, like libraries and museums, are major environmental consumers, continually challenged to balance the preservation needs of collections against the fiscal, human, and environmental resources to manage them efficiently and effectively.

Consequently, many questions arise for the archives profession when reflecting upon the sustainability successes that libraries and museums have already achieved. For example, have the professional ethics, values, and practices of archival science been influenced by the American environmental movement? If so, how and when did the changes occur? What guidelines are in place to help archivists better understand and embrace sustainability objectives—for facilities and for the day-to-day management of archival collections and services—in a holistic and systematic way? What can current and future archivists do to become more effective environmental educators and leaders? And finally, what can professional archives organizations, such as the SAA, the Midwest Archives Conference (MAC), or the Mid-Atlantic Regional Archives Conference (MARAC), do to support environmental sustainability initiatives for the community of archivists in the United States? The remainder of this article will examine these questions and summarize the extent to which the archival science profession has mirrored societal concerns and activism for the natural environment.

First, within the published research on archival theory and practice, a review of the literature reveals the following: a comprehensive study about sustainability does not yet exist in the archival science literature; studies about or related to environmental research, sustainability, or green archives have appeared in limited numbers and with a narrow scope over the past several decades; and among sustainability-related publications for the profession, the majority concentrate on facilities design and environmental control.⁵⁸ Second, while formal scholarship on archives and sustainability has been limited, it would be erroneous to conclude that archivists have ignored environmental issues altogether. However, without formal documentation of green efforts, it is difficult to determine the extent to which eco-friendly practices may have been adopted by different archives. This is an area of research that warrants future exploration and could be accomplished by conducting a survey of repositories across the country.

Lacking the availability of studies that trace environmental sustainability initiatives in archives, it appears that the first reference to greener archives was published

in the early 1990s with the work of Sandra Rowoldt,⁵⁹ who advocated for the use of architectural design principles rather than costly HVAC systems in the face of declining natural resources and rising energy costs. Rowoldt's environmentally-sustainable approach to archival facilities design is based upon the Stehkämper⁶⁰ model from the early 1970s, which called for architectural (passive) rather than artificial (aggressive) means to reduce a building's heat gain in the summer and increase its heat retention in the winter.

In addition to green building design, environmental research and its intersection with archives can be traced back to Todd Welch's article "'Green' Archivism: The Archival Response to Environmental Research,"⁶¹ which appeared in *American Archivist* during the spring of 1999. This article, while not directly focused on environmental stewardship by the profession, is important because it echoes the growing interest in collecting primary resources about environmental issues during the late 1990s, and serves as a wake-up call for archivists to recognize that "concern about the environment affects everyone and promises to remain a crucial issue into the foreseeable future."⁶² Unfortunately, publications on topics related to sustainability, even in the broadest sense, do not appear again in the archival science literature until the next decade.

In 2005, Mark A. Greene and Dennis Meissner published their treatise "More Product, Less Process: Revamping Traditional Archival Processing,"⁶³ now more commonly known as "MPLP." When viewed through a sustainability lens with specific consideration for the principles of the "quadruple bottom line," it could be argued that MPLP is a green approach not only to processing, but also to appraisal. The MPLP method first grew out of a desire to rethink the continual problem of processing backlogs in many repositories and better meet the needs of users who desired at least minimal access to previously-unavailable collections. MPLP also advocates for using "the least number of necessary processing steps when readying an unprocessed collection for use by researchers."⁶⁴ As stated by Greene himself:

The general principles of MPLP derive from fundamental statements about the archival enterprise, namely that 'use is the end of archival effort,' that substantial backlogs of collections not only hinder use but threaten repositories by undermining confidence of both resource allocators and donors; that in making processing decisions archivists should consider—not the traditions of the past—but the mission, audience, and resources of the present.⁶⁵

When managing the day-to-day activities of a repository with MPLP as a guiding principle, archivists are, in effect, balancing the sustainability equation or the "quadruple bottom line": people ("resource allocators and donors," and "audience"), planet ("resources of the present" and the future), profit (cost-effective use of staffing and resources), and program ("mission" and "resources"). Additionally, because MPLP argues for a user-centered approach to processing, it more closely aligns archivists with the needs of researchers. This is another critical aspect of sustainability in practice.

Not long after MPLP rocked the profession and changed the way many archivists carry out the appraisal process, a flurry of publications, initiatives within SAA, and leadership at the National Archives and Records Administration put a spotlight on growing interest in the topic of archival sustainability between 2006 and 2012. In

November 2006, the SAA charged a “Task Force on Archival Facilities” to create and publish guidelines for the design and construction of new and remodeled repositories. Although the recommendations to the Task Force did not specifically include sustainability as an objective, this first step by SAA to codify best practices for archival facilities speaks to the recognition that national standards are needed if archivists are to become more effective and socially-responsible stewards of public heritage in the twenty-first century. While the work of this important task force continued over the next several years,⁶⁶ articles on more environmentally-friendly alternatives to traditional, archival climate control⁶⁷ and green construction⁶⁸ appeared in the professional literature in 2008.

The following year (August 2009), the theme of the SAA annual meeting in Austin, Texas, was “Sustainable Archives.” The conference offered numerous presentations by leading archivists about sustainable practices for digitization, records management, and preservation. Also, in October 2009, the U.S. Federal Government enacted “Executive Order 13514 on Federal Leadership in Environmental, Energy, and Economic Performance,” which calls for all Federal agencies, including the National Archives and Records Administration, to “reduce greenhouse gas pollution, eliminate waste, improve energy and water performance, and leverage Federal purchasing power to support innovation and entrepreneurship.”⁶⁹ Most recently, in May 2011, SAA adopted the “Core Values of Archivists” that includes a statement on social responsibility. This will hopefully guide the profession towards a more sustainable future.

Beyond these initiatives, a continued dialogue is needed to more fully develop environmentally-friendly guidelines and best practices for archivists. To date, only one new publication has appeared in the literature that examines this topic: Mark Wolfe’s “Beyond ‘Green Buildings:’ Exploring the Effects of Jevons’ Paradox on the Sustainability of Archival Practices,”⁷⁰ which appeared in the journal *Archival Science* this year. Wolfe advocates that we, as a profession, develop and refine sustainable archival practices that will complement eco-friendly repository design. In his view, “the age of abundance,” as coined by Gerald Ham, has brought about “the exponential growth in the number of records [which] poses internal risks to the sustainability of repositories.”⁷¹ He demonstrates how the advent of the personal computer had the paradoxical effect of increasing the production of paper documents, instead of leading to the “paperless office,” as predicted by business gurus at the time. In response to the dilemma of bulky collections, Wolfe highlights two efficient methods of archival processing, MPLP and “postcustodial practices,” that might help archivists to sustainably manage our modern collections. Wolfe does not claim to have solved the sustainability challenge for archivists. He hastens to add, however, that if efficient archival practices are not adopted with care, these newly-found efficiencies in processing can have a reverse effect, leading to Jevons’ Paradox, or an increase rather than a decrease in the use of physical resources (archival facilities), human resources (staff to process and preserve collections), and fiscal resources (budgets to pay for additional space, collections processing, and management).

As this literature review and chronicle of sustainability initiatives suggests, it is evident that a movement to embrace environmental stewardship in archival theory and in practice has been growing steadily over the past several years. But it has not yet reached

a level of maturity, nor has it progressed as far as the green library or green museum movements. The body of published scholarship and guidelines on this topic is limited in scope, and a comprehensive resource to specifically guide archivists on greener paths does not exist. However, given the importance of worldwide environmental crises, it is now possible to outline theoretical strategies and practical resources that could be used to stimulate a sustainability dialogue among archivists.

Sustainability Framework and Tools: Practical Initiatives and Resources for Archivists

If archivists are going to go greener and strategize about more than eco-friendly buildings, there is already a wealth of best practices from other disciplines that can be adapted for archival science. The following discussion is offered as a primer to assist archivists with establishing an environmental sustainability program, and consists of a theoretical framework within which there are five sequential steps and related tools to accomplish it: evaluate, create and innovate, collaborate, educate, and re-evaluate.

Evaluate: Archives as Environmental Consumers

Before embarking on any sustainability program or project, the first recommended step is to conduct a formal assessment that evaluates the extent to which an archival repository is functioning as an environmental consumer. In other words, consider the questions, “How green is your archives?” and “How much of an impact (negative and positive) is your archives having upon the environment?”

One way to answer these questions, and assess an organization’s sustainable design and operations is to use what Mulford and Himmel describe as a “comprehensive energy audit.”⁷² Typically, this includes an assessment of compliance with industry-specific regulations, as well as data collection about “energy and water use, emissions, waste management, indoor air quality, pollution avoidance and prevention, and products, materials, and services sourcing.”⁷³ This diagnostic tool, while valuable for ascertaining green benchmarks, can be costly and often requires the expertise of a professional sustainability or energy consultant. If hiring a specialist is too cost-prohibitive, utility companies may offer their assistance for little to no fee. Mulford and Himmel also created the “Preliminary Green Assessment Checklist,” which can be used as a measurement tool at the outset of any sustainability program. An even simpler test that measures an institution’s primary carbon footprint, or the amount of carbon dioxide or greenhouse gases that are produced, can be determined by using a number of free carbon footprint calculators available on-line.⁷⁴

Create and Innovate: Archives as Environmental Leaders

Armed with either basic or exhaustive data about a repository’s green performance, the next step in building a sustainability framework requires environmental leadership and development of a strategic or action plan with a mission (i.e., purpose: what your organization does, for whom, and why), a vision (i.e., aspirations: what you want your organization to become), as well as long- and short-term goals and strategies for

achieving the desired goals. It follows, then, that one of the first goals in an archives’ strategic plan would be to create an environmental sustainability policy and standards by which goals can be measured. The standards or factors used to gauge success might be the “triple bottom line” (social, environmental, and economic factors), or the “quadruple bottom line” (people, planet, profit, and program) that considers the archival programs and collections housed in a repository. A strategic plan for sustainability can incorporate numerous topics, including, but not limited to, the following categories and examples:

Table 1:

Sustainability Categories (Goals and Objectives)	Sustainability Examples (Strategies and Outcomes)
Green Strategic Planning	Draft an environmental sustainability policy and standards; create a culture of sustainability through green consulting; continuing education, outreach, and advocacy
Green Assessment	Conduct energy audits, calculate carbon footprint, and work towards LEED certification for archival facilities
Green Facilities	Design new facilities and/or renovations that adhere to SAA-approved guidelines and best practices
Energy Efficiency and Energy Conservation	Implement preventative maintenance schedules for building management equipment; utilize efficient building management systems, HVAC systems, Energy Star® products and appliances; replace CFLs (compact fluorescent lighting) with more efficient LEDs ⁷⁵
Solid Waste Reduction and Recycling	Reduce, reuse, recycle; buy more green, non-toxic, and recycled products, including office supplies and cleaning products; reduce the use of disposable gloves and buy cotton gloves that can be washed and reused
Water Conservation	Monitor water use in facilities, check and repair leaks in plumbing, install water-efficient fixtures; mulch non-turf areas; use drought-tolerant, native plants in landscaping
Pollution Prevention	Reduce the use of toxic chemicals and products and/or replace them with safer alternatives; recycle hazardous universal waste such as fluorescent lighting, E-waste, or electronic equipment such as computers and batteries; paint with low to no VOCs (volatile organic compounds); add indoor plants to office areas to filter air; encourage green transportation, carpooling, and offer telecommuting as an option to employees

Sustainability Categories (Goals and Objectives)	Sustainability Examples (Strategies and Outcomes)
Green Collections Management	Purchase polyester label holders and reusable inserts for archival boxes; when digitizing materials, scan once for multiple purposes; when selecting archival supplies, consider buying from local vendors, if possible
Green Education and Outreach	Create a culture of sustainability by forming a local “green committee” composed of staff charged to investigate sustainability issues; create green programming to promote environmental literacy (e.g., water and energy conservation) for employees and the public; develop a “green practices toolbox” and work with green consultants to conduct energy audits; buy recycled promotional items such as pencils, and print promotional materials with vegetable or low-VOC inks
Green Exhibition Design	Implement and adhere to guidelines and best practices established by the OMSI “Green Exhibit Checklist, Version II”

The items compiled in Table 1 represent only a small sampling of possible green initiatives that have applicability for the archives profession. Some sustainability goals, such as the design and construction of a LEED-certified repository, can be extremely costly, while others, such as developing a “green committee” and buying less toxic cleaning products, do not require significant funding at all. Many, if not most, of these goals and objectives involve a change in perspective and a greener mindset that thinks and acts more sustainably.

Collaborate: Archives as Environmental Partners

With a baseline of data on existing green performance measurements and a plan of action or formal strategic goals in place, the third step towards building a sustainability framework necessitates collaboration and building partnerships with other green professions and experts. This involves working with others across various disciplines to achieve a successful balance between the now-familiar elements of “people, planet, profit, and program.”

Since archival facilities have perhaps the largest environmental impact in the “quadruple bottom line,” it follows that any sustainability program will be enhanced by communicating closely with utility companies, hiring an energy consultant, and, if you are lucky enough to have your own utilities supervisor on staff, collaborating frequently with HVAC and building management technicians. For example, facility preventative and routine maintenance schedules not only save energy, but also money. Regularly changing filters, belts, and valves, and inspecting the general quality of equipment needed to maintain your archival facility can prevent costly repairs and

damage to your building and collections, and make the environment safer and healthier for employees and the public.

To address pest problems that sometimes occur in facilities, archives could consider seeking out greener solutions with the assistance of experts in the field of Integrated Pest Management (IPM), which is a more holistic and environmentally-sustainable approach to insect control. IPM practitioners use common-sense methods to reduce the use of chemical pesticides through continuous monitoring and education.

Finally, archival organizations might partner with local businesses to purchase green office supplies and materials, and collaborate with local historical societies, museums, and/or other public heritage organizations to develop green exhibits or environmental literacy programming that benefit a variety of community stakeholders and users. There is an entire industry of green products and vendors that can supply everything from recycled paper and plastic goods to reclaimed and repurposed compact shelving⁷⁶ for library and archival facilities.

Educate: Archives as Environmental Educators and Sustainability Ambassadors

In addition to serving as environmental leaders and partners in this recommended theoretical framework, archives, like libraries and museums, have the opportunity to become sustainability ambassadors and fulfill an important educational mission by contributing to environmental literacy initiatives locally, nationally, and worldwide. Creating a culture of sustainability within a single repository can begin with one archivist advocating for the purchase of green cleaning products. But if ecologically-responsible strategies are to grow into a green archives movement, the assistance of leaders from the Society of American Archivists and other professional organizations is needed to propel the movement forward and advocate for wide adoption. Paralleling the work of SLA, ALA, and AAM, the Society of American Archivists could build upon the already-adopted social responsibility element now in the “Core Values of Archivists” and create additional benchmarks, indicators, and guidelines for adhering to sustainable practices. A green task force, similar to the one created in 2006 that researched and developed standards for archival facilities, could be charged to carry out this mission.

Re-evaluate: Archives as an Ecosystem

The final element in the proposed sustainability framework for archival repositories calls for a re-evaluation of the program and its initiatives. Like any successful project, an assessment phase that includes gathering formal and informal feedback; determining accomplishments, failures, and lessons learned; and capturing ideas for future improvements is vital to achieving sustainability objectives. The assessment phase also brings a measure of assurance that the archives and environmental stewardship goals are connected to the users, budgetary constraints, mission, and programs of a given repository. Like the natural world, all of these elements are connected in a relationship that is organic and symbiotic, and, like an ecosystem,⁷⁷ they need to constantly evolve in order to thrive.

Effective implementation of a sustainable archives program requires assessment skills, leadership, creativity and innovation, collaboration, education, and advocacy.

However, it is also understood that the general framework or model for sustainability presented in this article may not be feasible for every archival repository. Archives are by definition unique, with different missions, collections, staffing, expertise, fiscal resources, and physical constraints. Therefore, a “one size fits all” approach is idealistic and impractical. Instead, one additional and critical aspect of sustainability—often emphasized in the green architecture and business disciplines—is the concept of flexibility. In other words, achieving sustainability requires responsiveness and adaptability to identify and overcome challenges as they present themselves. As described poignantly by Brian Edwards, associate professor of sustainable architecture at the Royal Danish Academy of Fine Arts and author of *Green Architecture*, sustainability is “not universal, but like classicism, is modified by regional circumstances. It is an order of process and thought necessarily adjusted by local circumstances—the rightness of sustainability and its cultural relevance relies upon the celebration of difference.”⁷⁸ It is Edwards’s “celebration of difference” that makes sustainability and local interpretations of green solutions for archives not only challenging, but also worth the extra effort for “people, planet, profit, and program.”

Conclusion

The fields of librarianship, museum studies, and archival science have embraced sustainability in various degrees and with different outcomes that reflect the broader societal and ecological concerns of the American environmental movement throughout the past forty years. Scholarship about adopting green philosophies and practices in libraries, museums, and archives has appeared in numerous books, journal articles, on-line sources, and within the academic discourse of professional associations from the early 1970s through the present day, and it continues to educate and illuminate the ongoing imperative of environmental stewardship for cultural heritage professionals worldwide.

To move beyond constructing green buildings and managing facilities and operations and consider its impact on the natural world, the archives profession now has the opportunity to step back and assess where we have been and where we are going on this green journey. And using our new core value of “social responsibility,” coupled with a strategic framework as a starting point, we can put it into action to become more vocal ambassadors for environmental change. This idea is embodied in the collaborative work of the California Association of Museums, which advocates that sustainability starts with self-reflection and assessment to achieve a greater good: “Living and working green begins with how we look at the world around us, at our work and the impact we are making. Thinking green inspires us to be better citizens, better neighbors, and better leaders. And each of us regardless of job titles can be a leader in this task.”⁷⁹ This holistic approach to sustainability can be achieved if we—librarians, museum professionals, and archivists—all work together.

ABOUT THE AUTHOR: Heidi N. Abbey is the archivist and humanities reference librarian and coordinator of archives and special collections at the Penn State Harrisburg Library in Middletown, PA. She holds a B.A. in art history and biology from Juniata College, an M.A. in art history from the University of Maryland at College Park, and an M.L.S. with a specialization in archives and records management from the University at Albany—S.U.N.Y. Prior to joining the faculty at The Pennsylvania State University Libraries, she served as the digital collections librarian in archives and special collections at the University of Connecticut’s Thomas J. Dodd Research Center. Her research interests include archival advocacy and outreach, digital librarianship, museum studies, and women’s studies. She is active in the Mid-Atlantic Regional Archives Conference (MARAC), the Society of American Archivists (SAA), and currently cochair-elect of SAA’s Museum Archives Section. Ms. Abbey’s work has appeared in the *Art Libraries Journal*, and she has several forthcoming publications on the topics of archival outreach and instruction, archival exhibit design, and digital preservation.

NOTES

1. See especially Michele F. Pacifico and Thomas P. Wilsted, *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* (Chicago, IL: Society of American Archivists, 2009).
2. Anthony C. Floyd and Allan Bilka, *Green Building: A Professional’s Guide to Concepts, Codes, and Innovation: Includes IgCC Provisions* (Clifton Park, NY: Delmar Cengage Learning, 2012): 2-3.
3. The term “green library movement” was first coined by Monika Antonelli in her article “The Green Library Movement: An Overview of Green Library Literature and Actions from 1979 to the Future of Green Libraries,” *Electronic Green Journal* 1:27 (fall 2008): 1-11, <http://escholarship.org/uc/item/39d3v236> (15 June 2011).
4. Use of the phrase “green museum movement” first appeared in the work of Sarah S. Brophy and Elizabeth Wylie, *The Green Museum: A Primer on Environmental Practice* (Lanham, MD: Altamira Press, 2008): xi.
5. For an overview of sustainable design practices applied to building archival repositories, see Sarah Kim, “Green Archives: Applications of Green Construction to Archival Facilities,” *Primary Source* 28:1 (2008), http://www.msarchivists.org/theprimarysource/psvol28no1_kim2.htm (15 June 2011).
6. A recent review of the archival science literature highlights the lack of published research on the topic of archival sustainability, with the exception of Mark Wolfe’s “Beyond ‘Green Buildings’: Exploring the Effects of Jevons’ Paradox on the Sustainability of Archival Practices,” *Archival Science* 12 (2012): 35-50, doi: 10.1007/s10502-011-9143-4 (14 July 2011).
7. Society of American Archivists, “SAA Core Values Statement and Code of Ethics,” <http://www2.archivists.org/statements/saa-core-values-statement-and-code-of-ethics> (21 February 2012).
8. Sarah S. Brophy, “Environmental Sustainability—How Does It Fit with the (8.9.10 Draft) of Core Value of Archivists?” *The ArchivesInfo Blog*, 4 October 2010, <http://archivesinfo.blogspot.com/2010/10/environmental-sustainability-how-does.html> (19 July 2011).
9. Sonya Newenhouse, *EnAct: Steps to Greener Living* (Madison, WI: Madison Environmental Group, Inc., 2009): 5.
10. United Nations’ World Commission on Environment and Development, “Our Common Future: Report of the World Commission on Environment and Development,” Chapter 2: Towards Sustainable Development, June 1987, <http://www.un-documents.net/ocf-02.htm> (20 December 2011).
11. John Elkington, noted author and global authority on sustainable development and corporate responsibility, is credited with originating the concept for the term “triple bottom line” in his article

- "Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development," *California Management Review* 36:2 (winter 1994): 90-100. The phrase was later published for the first time in his book *Cannibals with Forks: The Triple Bottom Line of 21st Century Business* (Oxford: Capstone Publishing, 1997), which is considered by many experts in the field as the bible of sustainability.
12. The development of the term "people, planet, and profit" in 1995 is attributed to John Elkington, who is also the co-founder of "SustainAbility," an independent think tank and strategy consultancy in London, England. See the Web site sustainability.com for more information.
 13. Brophy and Wylie, *Green Museum*, 8.
 14. For more information on the American environmental movement, see Robert Gottlieb, *Forcing the Spring: The Transformation of the American Environmental Movement*, 2nd ed. (Washington, D.C.: Island Press, 2005); and Philip Shabecoff, *A Fierce Green Fire: The American Environmental Movement* (Washington, D.C.: Island Press, 2003).
 15. Jack Lewis, "The Birth of EPA," *EPA Journal* 11:9 (November 1985): 7.
 16. Frederick Stoss, "Libraries Taking the 'LEED': Green Libraries Leading in Energy and Environmental Design," *Online* 34:2 (March/April 2010): 24
 17. Frederick Stoss, "How and Why We Got Here Today: A History of the ALA Task Force on the Environment," *SRRT Newsletter* 168 (September 2009) <http://libr.org/srrt/news/srrt168.php#6.1> (20 December 2011). For a more comprehensive study on ALA's contributions to environmental sustainability for the library profession as a whole, see also Maria A. Jankowska, "Going Beyond Environmental Programs and Green Practices at the American Library Association," *Electronic Green Journal* 1:32 (fall 2011): 1-17, <http://escholarship.org/uc/item/1zs6k7m2> (20 December 2011).
 18. Stoss, "Libraries Taking the 'LEED,'" 26. See also Robert Daugherty and Robert F. Moran, Jr., "Fiftieth Anniversary Special: A Brief History and Timeline of the Library Administration and Management Association, 1957-2007," *Library Leadership & Management* 21:3 (summer 2007): 109-123.
 19. Monika Antonelli, "The Green Library Movement: An Overview of Green Library Literature and Actions from 1979 to the Future of Green Libraries," *Electronic Green Journal* 1:27 (fall 2008): 1-11, <http://escholarship.org/uc/item/39d3v236> (15 June 2011).
 20. Maria A. Jankowska and James W. Marcum, "Sustainability Challenge for Academic Libraries: Planning for the Future," *College & Research Libraries* 71 (March 2010): 160-170.
 21. James Lovelock, *Gaia: A New Look at Life on Earth* (New York: Oxford University Press, 1979): 11.
 22. John Barry, "Lovelock, James Ephraim," *Green Ethics and Philosophy: An A-to-Z Guide*, ed. Julie Newman and Paul Robbins (Thousand Oaks, CA: SAGE Publications, Inc., 2011) 307.
 23. James LaRue and Suzanne LaRue, "The Green Librarian," *Wilson Library Bulletin* 65:6 (February 1991): 27.
 24. Jankowska and Marcum, "Sustainability Challenge," 161.
 25. *Ibid.*, 167.
 26. *Ibid.*, 164-165.
 27. For articles published in *College & Research Libraries News*, see especially Kathleen Rickert, "Greening Our College Libraries: Complete the Cycle of the Three Rs," *College & Research Libraries News* 62:8 (September 2001): 825-828; Megan Coder, "It's Not Easy Being Green. Or Is It?" *College & Research Libraries News* 69:11 (December 2008): 692-694; and Maria A. Jankowska, "A Call for Sustainable Library Operations and Services: A Response to ACRL's 2007 Environmental Scan," *College & Research Libraries News* (June 2008): 323-324. Two key publications issued by the American Library Association include Dorothy Waterfill Trotter, "Going for the Green," *American Libraries* 39: (April 2008): 40-43; and Wanda Urbanska, "A Greener Library, A Greener You," *American Libraries* 40:4 (2009): 52-55. For content published by *Library Journal*, see especially Bill Brown, "The New Green Standard: With the LEED Rating System in Place it is Easier to Make Sure Your New Library Saves Money as it Treads Lightly on Natural Resources," *Library Journal* 128:20 (December 2003): 61-64; Scott M. Bushnell, "Library's Green Annex Brings Acclaim, Growth," *Library Journal* 134:9 (May 2009): 32; Robert Eagan, "Sense & Sustainability," *Library Journal* 133:2 (February 2008): 40-43; Francine Fialkoff, "Green Libraries are Local," *Library Journal* 133:11 (June 2008): 8; Bette-Lee Fox, "The Constant Library: Inside 210 Public and Academic Building Projects for 2009," *Library Journal* 134:20 (December 2009): 26-40; Bette-Lee Fox, "Going, Going, Green: *LJ's* Annual Wrap-Up Features 168 Public Library Projects and 21 Academic Buildings," *Library Journal* 132:20 (December 2007): 44-45; Raya Kuzyk, "Going

- Green: *LJ's* Second Design Institute Tackles the Ins and Outs of Sustainable Buildings," *Library By Design: Supplement to Library Journal* 133:9 (May 2008): 1-7; Rebecca Miller, "Lead with Green: Louise Schaper Says Sustainable Management is Critical and Touches Every Aspect of the Library," *Library Journal* 135:9 (May 2010): 22-23; Rebecca Miller and Francine Fialkoff, "Part of the Solution: *LJ's* Design Institute West Takes the Green Conversation a Step Further," *Library By Design: Supplement to Library Journal* (September 2008): 14-15; Jane C. Neale, "Go Green!" *Library Journal* 133:2 (February 2008): 46; Jennifer Pinkowski, "Keeping Track of Green Libraries," *Library Journal* 132:15 (September 2007): 27; and Louise L. Schaper, "Let 'Green' Creep: Ten Steps to Sustainable Library Operations," *Library Journal* 135:9 (May 2010): 6-9.
28. It is not surprising that the topic of green libraries took center stage in the library literature during 2008. According to the International Institute for Sustainable Development's "Sustainable Development Timeline," the world's food, energy, and financial crises converged in 2008 when 1) food prices worldwide increased 43 percent in twelve months, 2) fuel costs in China and India soared due to increased demand, and 3) mortgage lending in the United States collapsed, triggering a worldwide economic recession. See the "Sustainable Development Timeline" for more information: http://www.iisd.org/pdf/2012/sd_timeline_2012.pdf.
 29. Based upon the author's review of the literature, there were at least a total of seven green-themed articles in *American Libraries*, *College & Research Libraries News* and *Library Journal* during 2008. See especially resources listed in note 27.
 30. See Virginia Connell, "Greening the Library: Collection Development Decisions," *Endnotes: The Journal of the New Members Round Table* 1:1 (May 2010): 1-15, and Jackie Shane, "Positioning Your Library for Solar (and Financial) Gain. Improving Energy Efficiency, Lighting, and Ventilation with Primarily Passive Techniques," *Journal of Academic Librarianship* 38:2 (February 2012): 115-122.
 31. Sam McBane Mulford and Ned A. Himmel, *How Green is My Library?* (Santa Barbara, CA: ABC-CLIO, LLC, 2010): 4-16. For additional information about and definitions for new and emerging green terminology, see especially Julie Newman and Paul Robbins, ed., *Green Ethics and Philosophy: An A-to-Z Guide* (Thousand Oaks, CA: SAGE Publications, Inc., 2011), and Kevin Wehr and Paul Robbins, ed., *Green Culture: An A-to-Z Guide* (Los Angeles, CA: SAGE Publications, Inc., 2011), which are part of the twelve-volume *SAGE Reference Series on Green Society: Toward a Sustainable Future*.
 32. Mulford and Himmel, *How Green?*, 55-59.
 33. Kathryn Miller, *Public Libraries Going Green* (Chicago: American Library Association, 2010): 1-4.
 34. Kevin J. Coyle, *Environmental Literacy in America: What Ten Years of NEETF/Roper Research and Related Studies Say about Environmental Literacy in the U.S.*, The National Environmental Education & Training Foundation (NEETF), September 2005, <http://www.neefusa.org/pdf/ELR2005.pdf> (15 May 2011).
 35. Coyle, "Summary," *Environmental Literacy*, ix.
 36. To date, a master's project, written by Rachel Byers in 2008, is currently the only known publication that includes a review of the museum studies literature on the topic of green museums. See Rachel Byers, "Green Museums + Green Exhibits: Communicating Sustainability through Content + Design" (master's thesis, University of Oregon, 2008) https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/8260/Byers_fall2008_project.pdf?sequence=1 (12 November 2012).
 37. Byers, "Green Museums + Green Exhibits," 14. See also Sarah S. Brophy and Elizabeth Wylie, *The Green Museum: A Primer on Environmental Practice* (Lanham, MD: AltaMira Press, 2008): 88.
 38. Boston Children's Museum, "The Recycle Shop," <http://www.bostonkids.org/exhibits/recycle.html> (1 November 2011). Unfortunately, after forty years, The Recycle Shop at the Boston Children's Museum closed in July 2011 due to the lack of availability of recycled items. This indicates that recycled materials are being managed more efficiently and effectively by industries in the region; however, the museum still incorporates information about recycling in its art studio and science exhibits. See the Facebook announcement at <http://www.facebook.com/events/138122856267038/>. Also, despite the closing of The Recycle Shop, the Boston Children's Museum is still an environmental leader, as it was the first green museum in the city of Boston, earning LEED certification with gold status in 2007.
 39. See especially Alma S. Wittlin, *Museums: In Search of a Usable Future* (Cambridge, MA: MIT Press, 1970), and Duncan F. Cameron, "The Museum, a Temple or the Forum," *Curator: The Museum Journal* 14:1 (March 1971): 11-24. Duncan, in particular, mentions the environmental pollution issues

- of the mid-1950s and the “social irresponsibility” of curators during that time who all but ignored the topic in museum programming.
40. “Museology” is defined by the International Council of Museums (ICOM) as “the theoretical approach to any individual or collective human activity related to the preservation, interpretation and communication of our cultural and natural heritage, and with the social context in which a specific man/object relationship takes place. Although the field of museology is much broader than the study of the museum itself, its main focus remains the functions, the activities and the role in society of the museum as a repository of collective memory.” See ICOM—Museology International Committee for Museology, <http://icom.museum/the-committees/international-committees/international-committee/international-committee-for-museology/> (1 March 2012). For an overview of the theoretical framework within the museum studies profession during the 1990s, see Julia D. Harrison, “Ideas of Museums in the 1990s,” *Museum Management and Curatorship* 13 (1993): 160-176.
 41. Stephen E. Weil, “Rethinking the Museum: An Emerging New Paradigm” in *Reinventing the Museum: Historical and Contemporary Perspectives on the Paradigm Shift*, ed. Gail Anderson (Walnut Creek, CA: AltaMira Press, 2004): 77.
 42. UNESCO, *Our Creative Diversity: Report of the World Commission on Culture and Development, Summary Version* (Paris: UNESCO Publishing, 1996) July 1996, <http://unesdoc.unesco.org/images/0010/001055/105586e.pdf> (1 November 2011). For additional information about culture and sustainability, see also Jon Hawkes, *The Fourth Pillar of Sustainability: Culture’s Essential Role in Public Planning* (Melbourne, Australia: Common Ground Publishing Pty., Ltd., 2001).
 43. Tereza C. Scheiner, “Ethics and the Environment: Museum Ethics and the Environment: In Search of a Common Virtue” in *Museum Ethics: Theory and Practice*, ed. Gary Edson (New York: Routledge, 1997): 178-186.
 44. Douglas Worts, “On Museums, Culture and Sustainable Development” in *Museums and Sustainable Communities: Canadian Perspectives*, ed. Lisette Ferera (Quebec: ICOM Canada, 1998): 21-27. See also Douglas Worts, “Museums in Search of a Sustainable Future,” *Alberta Museums Review* (fall 2004): 40-57, http://douglasworts.org/wp-content/uploads/2009/06/worts_ma_review_article.pdf (1 May 2012); and Douglas Worts, “Culture and Museums in the Winds of Change: The Need for Cultural Indicators,” *Culture and Local Governance* 3:1-2 (2011): 117-132.
 45. Glenn C. Sutter and Douglas Worts, “Negotiating a Sustainable Path: Museums and Societal Therapy,” in *Looking Reality in the Eye: Museums and Social Responsibility*, ed. Robert R. Janes and Gerald T. Conaty (Calgary, Canada: University of Calgary Press, 2005).
 46. Brenda Baker and John Robinson, “The Sustainable Museum: It’s Not Easy Being Green,” *Hand to Hand: Association of Children’s Museum Quarterly* 14:4 (winter 2000): 4-5, 7. The entire winter 2000 issue of *Hand to Hand* was a special issue dedicated to the topic, “Do the Right Thing: Children’s Museums & Social Responsibility.” In spring 2006, another special issue of *Hand to Hand* was published, which focused on “Green Design & Sustainability.” See also Brenda Baker, “Learning from Leopold and Seuss,” *Hand to Hand* 20:1 (spring 2006): 1-2.
 47. Sarah Brophy and Elizabeth Wylie, “It’s Easy Being Green: Museums and the Green Movement,” *Museum News* (September/October 2006): 38-45; Elizabeth Wylie and Sarah S. Brophy, “The Greener Good: The Enviro-Active Museum,” *Museum* 87:1 (January/February 2008): 40-47; and Sarah S. Brophy and Elizabeth Wylie, “Saving Collections and the Planet,” *Museum* 88:6 (November/December 2009): 52-7, 59-60. Please note that *Museum News* and *Museum* are the same publication from the AAM; beginning with 87:1 (January/February 2008), the title of the publication was changed to simply “*Museum*.”
 48. Terry Link, “Models of Sustainability: Museums, Citizenship, and Common Wealth,” *Museums & Social Issues: A Journal of Reflective Discourse* 1:2 (fall 2006): 173-190. The entire fall 2006 issue of *Museums & Social Issues* focused on the topic, “A Culture of Sustainability.” See also especially Glenn C. Sutter, “Thinking Like a System: Are Museums Up to the Challenge?,” *Museums & Social Issues* 1:2 (fall 2006): 203-218; and Douglas Worts, “Fostering a Culture of Sustainability,” *Museums & Social Issues* 1:2 (fall 2006): 151-172.
 49. Association of Zoos and Aquariums, “Green Scientific Advisory Group,” <http://www.aza.org/green-practices-scientific-advisory-group/> (1 May 2012).
 50. California Association of Museums, Green Museums Initiative Committee, “Green Museums Initiative,” 2009, *The Green Museums Initiative*, <http://www.calmuseums.info/gmi/index.html> (12 May 2012).

51. Sarah S. Brophy and Elizabeth Wylie, *The Green Museum: A Primer on Environmental Practice* (Lanham, MD: AltaMira Press, 2008): 151. Since publication of Brophy and Wylie's work in 2008, two additional texts on museum sustainability have been published in the United Kingdom: Rachel Madan, *Sustainable Museums: Strategies for the 21st Century* (London: Museums, Etc., 2011), and Gregory Chamberlain, ed., *Greener Museums: Sustainability, Society, and Public Engagement* (London: Museum Identity Limited, 2011). The author regrets that, due to the already large scope of this article, they could not be reviewed and included here.
52. Sarah Brophy, "Quadruple Bottom Line: People, Planet, Profit AND Program," *Sustainable Museums Blog*, 18 May 2010, <http://sustainablemuseums.blogspot.com/2010/05/quadruple-bottom-line-people-planet.html> (1 May 2012).
53. Madison Children's Museum, "Begin: Purpose of This Site," *Greenexhibits.org*, 2005, <http://www.greenexhibits.org/begin/index.shtml> (3 August 2011).
54. For an overview of the Oregon Museum of Science and Industry's model for evaluating exhibit sustainability, see Jessica Willcox, "OMSI Green Exhibit Certification: A Cost-Saving Tool for the Exhibition Field," *Exhibitionist* 28:1 (spring 2009): 14-20. See also the entire "Green and Lean" spring 2009 issue of *Exhibitionist*, which is centered around the theme of green exhibit design.
55. National Science Foundation, "Sustainability: Promoting Sustainable Decision Making in Informal Education, Award Abstract #0917595," *National Science Foundation*, 3 September 2009, <http://nsf.gov/awardsearch/showAward.do?AwardNumber=0917595> (1 November 2012).
56. Oregon Museum of Science and Industry, "exhibitSEED: Social, Economic, Environmental Development," [exhibitSEED.org](http://www.exhibitseed.org/), 2010, <http://www.exhibitseed.org/> (30 May 2012).
57. Kari Jensen, senior exhibit developer, Oregon Museum of Science and Industry, telephone interview by the author, 5 July 2012.
58. See notes 1, 5, and 6.
59. Sandra Rowoldt, "The Greening of Archive Buildings: Natural Air-Conditioning in the Southern African Context," *Janus: Archival Review* 2 (1993): 36-41. See also Sandra Rowoldt, "Going Archival Green: Implications of Doing It Naturally in Southern African Archives and Libraries," *South African Journal of Library and Information Science* 66:4 (December 1998): 141-147.
60. Hugo Stehkämper, "'Natural' Air Conditioning of Stacks," *Restaurator: International Journal for the Preservation of Library and Archival Material* 9:4 (January 1988): 163-177, which is a revised and expanded English version of his work which appeared in *Der Archivar* 26 (1973): 449-462. The Stehkämper model was used successfully by the city archives in Cologne, Germany; thus, it is sometimes referred to as the "Cologne model."
61. Todd Welch, "'Green' Archivism: The Archival Response to Environmental Research," *American Archivist* 62:1 (spring 1999): 74-94.
62. Welch, "'Green' Archivism," 90.
63. Mark A. Greene and Dennis Meissner, "More Product, Less Process: Revamping Traditional Archival Processing," *American Archivist* 68:2 (fall/winter 2005): 208-263.
64. Janet Hauck, "The ABC's of MPLP: How to Apply the 'More Product, Less Process' Method in Your Archives," *Easy Access: Newsletter of the Northwest Archivists, Inc.* 33:3 (September 2007): 3, http://northwestarchivistsinc.wildapricot.org/resources/Documents/EAvol33issue3_Sept2007.pdf (1 May 2012).
65. Mark A. Greene, "MPLP: It's Not Just for Processing Anymore," *American Archivist* 73:1 (spring/summer 2010): 176.
66. The work of the "Task Force on Archival Facilities" was completed in 2008 and culminated with the following publication: Michele F. Pacifico and Thomas P. Wilsted, ed. *Archival and Special Collections Facilities: Guidelines for Archivists, Librarians, Architects, and Engineers* (Chicago: Society of American Archivists, 2009).
67. See Travis L. Puller, "How Archives Can 'Go Green' Responsibly: Using Alternative Methods for Climate Control in Archives," *Infinity: The Newsletter of the SAA Preservation Section* 23:2 (summer 2008): 7-9, <http://www2.archivists.org/sites/all/files/Infinity%20Summer%202008.pdf> (15 June 2011).
68. See Sarah Kim, "Green Archives: Applications of Green Construction to Archival Facilities," *Primary Source* 28:1 (2008), http://www.msarchivists.org/theprimarysource/psvol28no1/psvol28no1_kim2.htm (15 June 2011); and France Saïe Belaïsch, "Green Archives Buildings: Archive Building and Sustainable Development," *Comma* 2 (2008): 133-138.

69. United States Federal Government, "Sustainability: Leading by Example in Environmental, Energy, and Economic Performance," *Performance.gov*, 2012, <http://sustainability.performance.gov/> (1 May 2012).
70. Mark Wolfe, "Beyond 'Green Buildings': Exploring the Effects of Jevons' Paradox on the Sustainability of Archival Practices," *Archival Science* 12 (2012): 35-50, doi: 10.1007/s10502-011-9143-4 (14 July 2011).
71. Wolfe, "Beyond 'Green Buildings,'" 36.
72. Mulford and Himmel, *How Green?*, 50-51.
73. *Ibid.*, 51.
74. There are numerous carbon footprint calculators on-line. See especially "Carbon Footprint Business Calculator" at <http://www.carbonfootprint.com/calculator1.html>, and the "Carbon Neutral Company's Footprint Calculator" at <http://www.carbonneutral.com/carbon-calculators/>.
75. The recommendation to replace incandescent bulbs, which are energy inefficient, and CFLs, which contain hazardous mercury, with new LEDs is based upon research that illustrates a 50 to 80 percent energy savings with the use of LEDs. Also, the U.S. Energy Independence and Security Act of 2007 started the ban of 100-watt incandescent bulbs in January 2012. By the year 2013, 75-watt bulbs will be banned, with a ban of 60-watt and 40-watt bulbs to follow by 2014. LEDs, while currently expensive, have no damaging ultraviolet rays and a working temperature range of -40 to 140 degrees Fahrenheit. According to Clean Light Green Light, "...if just 25% of fluorescent lighting fixtures in the U.S. were converted to LEDs, we could...save 15 billion in electricity costs annually, decommission 133 coal burning power plants, reduce carbon emissions by 158 metric tons and avoid releasing 5,700 pounds of airborne mercury." For more information about LEDs, see Clean Light Green Light, "LED Technology: The Future of Lighting, 2011 Product Catalog," http://www.cleanlightgreenlight.com/CLGL2011Product_Catalog_lo.pdf (20 August 2011). See also Dan Koeppe, "The Future of Light is the LED," *Wired Magazine* (September 2011), 19 August 2011, http://www.wired.com/magazine/2011/08/ff_lightbulbs/ (20 August 2011).
76. With the widespread transition from paper-based to E-records in many disciplines, especially the legal and medical professions, many organizations are removing and discarding high-density records storage systems. One vendor, R & J Retrieval Systems, Inc. based in Pine Island, New York, is reclaiming these systems and creating a market for them as recycled and repurposed compact shelving. Archives looking for more cost-effective solutions to expand their collections storage areas may wish to consider this option.
77. For additional discussion on the archives-ecosystem metaphor, see Julia Martin and David Coleman, "Change the Metaphor: The Archive as an Ecosystem," *JEP: The Journal of Electronic Publishing* 7:3 (April 2002) doi: <http://dx.doi.org/10.3998/3336451.0007.301> (1 May 2012); and Erik A. Moore, "Birds of a Feather: Some Fundamentals on the Archives-Ecology Paradigm," *Archivaria: The Journal of the Association of Canadian Archivists* 63 (spring 2007): 103-119.
78. Brian Edwards, "Sustainability: The Search for an Earthly Paradise," in *Green Architecture*, ed. Brian Edwards, 71:4 (July 2001) of *Architectural Design* (London: Wiley-Academy, 2001): 7.
79. California Association of Museums, Green Museums Initiative Committee, "Thinking Green," 2009, *The Green Museums Initiative*, <http://www.calmuseums.info/gmi/ThinkingGreen.html> (12 May 2012).

