ABSTRACT

This white paper was written to conclude and summarize a National Endowment for the Humanities Research and Development Tier I grant-funded project titled *Embedding Sustainability in Cultural Heritage Conservation Education*. Awarded to the UCLA/Getty Interdisciplinary Program in the Conservation of Cultural Heritage, the project took place from March 2021 through March 2022. Ellen Pearlstein and Glenn Wharton served as project co-Principal Investigators. Justine Wuebold served as project Research Associate, and Laboratory Manager William Shelley assisted in research on sustainability education in conservation laboratories.

The project is the first phase of a larger initiative to integrate sustainability theory and practice into cultural heritage conservation education. This paper outlines our findings from literature research, a survey of the field, communications and conversations with many colleagues, and pilot investigations to integrate sustainability in courses within our program. We begin with high level reflections about sustainability in cultural heritage conservation, then we present findings from our survey and communications with colleagues in the field, and we conclude with a strategic plan for future development of our initiative. We also provide references, an annotated bibliography, and a list of relevant conferences & publications.
INTRODUCTION

Conservators of cultural heritage make up a small but consequential body of professionals with interdisciplinary background and training that bridges the gap between humanities and science. Many of these skills and approaches are complementary with those necessary for creating sustainable and creative solutions to problems such as climate change, accessibility challenges, social justice and equity. Finding methods to bolster the need for research and initiatives centered around sustainable practice is therefore of vital importance in Conservation education.

Our initiative is focused on building the resources needed to support emerging professionals, as well as those mid-career conservators who seek to make sustainable changes to their practice. This means working across disciplines, for example in the education field, where advances in sustainability competencies have been researched and tested in focus groups. Building bridges between departments and centers on the UCLA campus and exploring the research by our colleagues at the Getty Center has allowed the program to connect locally. Surveys and interviews with conservation educators, both in North America and abroad, led to an expansive global understanding of how educators are currently grappling with how to integrate sustainability into curricula.

I. THE NEED (Gaps and Challenges)

A. Definition

The interpretation of sustainability can vary across disciplines and cultures. It means something different to industrial societies than to those cultures that maintain a spiritual bond with the non-living and non-human natural world. In the introduction of Going Beyond: Perceptions of Sustainability in Heritage Studies No. 2, defining sustainability requires a contextual understanding of “what is valuable, who are the stakeholders involved, how are decisions influencing sustainability being taken, and by whom?” (Albert, et al., 2017). It involves recognizing who has agency to make sustainable change and where the greatest impacts can be made.

Museums are in a unique position to be leaders in sustainability as institutions connected with communities in design, technology, science, art, history, Indigenous culture, and many more parts of the sustainability equation. Museums can reflect the past while envisioning a future where the needs of the environment, the economy, society, and culture exist in a balance. Finding ways to instill a rethinking of our systems, a redesigning of our future, and a reflection on past traditions is a necessity for cultural heritage conservation and museum studies education. The cultural heritage sector plays a crucial role in addressing the severity and urgency of climate change because of its ability to tell a new narrative through the safeguarding of human experiences, practices, expressions, and the associated objects and sites we hope to preserve for the future.

In defining sustainability, the environmental concerns are not mutually exclusive from social and economic facets. In fact, they are heavily interrelated and linked through the concept of intersectional environmentalism. The idea of thinking “intersectionally” is holistic in signifying the overlap between racial and gender identities advocated by professor of law Kimberlé Crenshaw in her theories of intersectional feminism (Crenshaw, 1989). Now the movement has evolved to
examine these intersections alongside the experiences of disproportionately disadvantaged populations due to environmental crises and climate change. The decisions involved in conserving heritage are likewise interconnected between the welfare of the object and relinking the intangible heritage of objects and sites to their respective communities and cultural context (Tse, et al., 2018). Issues involving the disappearance of culturally relevant sites and monuments in disaster-prone areas continuously affect marginalized societies, especially those who do not have the financial capacity to prevent future catastrophe and adapt to the changing landscape.

B. Assumptions and Biases (epistemology)

In preserving a collection or site sustainably, professionals must also consider the multiple perspectives relating to the artifact’s intangible connections with the communities from which they originated. How the assumptions of conservation professions affect the way objects are viewed has been the subject of research in community-based collaborative and participatory projects for decades, with many case studies available. One case study of Southeast Asian museums applies preventive conservation through the interrelated contexts of objects, people, place and time. Tse, et. al. highlight where transformation is occurring and the existing gaps that need to be reconciled in the process of re-evaluating and recognizing multiple object meanings (Tse, et al., 2018).

Considerations of artistic intention, artwork condition, and political context have been used as excuses for the conservator to take a “neutral” stance. Peters discusses the lack of neutrality on the part of conservators in making decisions for the context of objects on display, “preserving, revealing, enhancing, recovering, interpreting or even ignoring a given aspect of this object” (Peters, 2020). Each situation is so unique and complex, requiring creative problem solving for a customized response. These are the projects that lead to some of the most eye-opening and critical experiences in educating for a sustainable future, and they relate directly to the ethics of caring for people through caring for cultural collections and historic sites. By upholding and justifying the validity of dominant cultures who have for so long controlled the narrative, conservators are finding they must take a stance on matters on this hierarchical and transactional mindset. Ethical stewardship of collections involves the accountability of collections staff to shift the narrative toward providing access, to a democratic partnership for preserving intangible knowledge and experiences, and relinquishing expertise to different groups of knowledge holders.

As Peters explains, the path for receiving knowledge is not linear, where the experts educate and the novices passively receive, which allows the hierarchical and transactional relationship so inherent to colonial narratives for justification of control to persist. This concept of non-transactional learning is similarly described by Scarff-Seater and Ceulemans:

“A paradox exists between sustainability in higher education as a message that provokes thinking and action through transformative learning, and current sustainability in higher education pedagogy, which lacks the sustenance to facilitate sustainability thinking and behaviour, and often is stymied by a transmissive and lecture-driven delivery.” (Scarff-Seater & Ceulemans, 2017)
II. METHODOLOGY (Frameworks)

A. Three Pillars

The Three Pillars of Sustainability are environmental, social, and economic sustainability, with a fourth pillar recently proposed as cultural sustainability (British Council, 2020). Effective approaches to sustainability recognize that these pillars do not stand separately. As mentioned previously, the intersectionality and interdependence of issues involving all of these pillars is imperative to understanding how systems can be structured for inclusion of essential perspectives and presenting opportunities for collaborative efforts. While the origins of this school of thought is debated, there are many cases where its implications have been validated, such as through the concept of planetary boundaries, which is essentially living within the means of our living planet and its natural resources. The concept involves coming to terms with the fact that humanity is already living outside our planetary boundaries, both socially and ecologically. Therefore, keeping in mind the essential needs for humanity (food, health, education, income, peace/justice, political voice, social equity, gender equality, housing, access to networks, energy, and water/sanitation), we can ensure that a thriving humanity is more meaningful in the long-term than the focus on growth that is often attributed to successful economies. Teaching this shift in perspective includes training learners in resilience, adaptation, and holistic problem solving techniques.

B. EF$S$/ESD

Matthias Barth describes Education for Sustainable Development (ESD) as “a vision of education that seeks to balance human and economic well-being with cultural traditions and respect for the Earth's natural resources” (Barth, 2015). Integrating Education for Sustainability involves a complex interweaving of sustainability logic and perspective into course study. Universities have been facing pressure to transform their programs to suit a new generation in a changing world that needs to be equipped with the tools to cooperatively solve complex contemporary issues. The advent of Education for Sustainability began with the 1987 report from the World Commission on Environment and Development (WCED), which coined the commonly used definition of Sustainable Development: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (WCED, 1987).

The United Nations’ 17 Sustainable Development Goals (SDGs) are tied to their 2030 framework to “achieve a better future for all”. Cultural heritage is embracing and is beginning to embrace the SDGs and find ways to align the goals with their institutional mission and programming. Decision making and problem solving require the ability to view situations holistically, taking into account the aforementioned pillars of sustainability and the many overlaps between aspects of sustainability.

C. Curriculum Research & Modeling

Over the last decade, many organizations have linked cultural heritage and climate change in an effort to build community for ideas of how to shift our practices to meet the challenges we now
face. Some are looking at the impacts of COVID-19 policy and how continuation of these procedures, such as limiting loans and courier trips, saving energy through experimental climate control levels, and rethinking the way we provide access to collections materials may lower the carbon footprint of conservation practices. These ideas are considered radical in the field, but could be adopted more widely if case studies on the effects on collections could be published and replicated. These are the kinds of activities that could prove beneficial for students to explore while exploring alternative methods and collaborative efforts leading to ethical resource consumption.

The Student Ambassador Program in the Sustainability in Conservation non-profit organization establishes the agency for learning through making sustainable action in graduate programs and internships. Its tools, resources, and sustainable practices and programs that students institute provide not only a robust portfolio opportunity, but they also prepare the student participants to develop similar programs in future further stages of their careers. Weaving these concepts into graduate courses promotes many of the existing interests and proclivities of students and empowers them to be change agents for the field. Where conservation has traditionally been a field of independent treatment, working in groups to find solutions encourages collaboration for sustainable strategy building so everyone learns from each other.

Conservation communities are intergenerational and focused on the care of objects and sites, which necessarily includes their culture and community. In Conservation education, that spirit of collaboration is highlighted during the learning process in creative problem solving and solution building. Especially as we see crises unfold due to climate change, the tight-knit community of conservation must prevail by seeking the mentorship of aging generations of conservators and passing along knowledge of craft before it’s lost. As a reciprocal measure, there is much that emerging conservators can share with more established professionals in terms of shifts in thinking among their peers. Studies in intergenerational learning suggest successful design of systems for knowledge sharing in organizations, where autonomy and empowerment are noted conditions for facilitating this transfer across diverse age groups (Bjursell, 2015).

III. RESULTS (Data)

A. Survey Introduction

Our survey was conducted from September 3, 2021 through October 5, 2021 to collect data on sustainability in conservation and cultural heritage preservation programs. We created an aggregated list of conservation training programs, conservation departments, and conservation organizations to send targeted emails to approximately 175 educators, coordinators, and department heads to ensure a large geographic scope. The survey was also posted to the American Institute for Conservation (AIC) Global Conservation Forum, and we encouraged colleagues and Project Advisors to share with their networks. Ninety-five participants filled out the survey and we received an additional twenty-five partial responses.

The survey was anonymous, but we did offer our contact information and the option to provide email addresses to facilitate information sharing. The survey questions included demographic
information about participants’ institutions and the country in which they work. The responses by country spanned a very broad global scope consisting of the following regions: Europe; the Middle East; Australasia; North America; and South America. The survey questions regarding curriculum were formulated with the goal of understanding how sustainability is structured in program coursework, either through separate classes or integrated more broadly, and about incorporating sustainability through use of specific materials and in performing conservation activities. We also wanted to ascertain if there are plans for future sustainability inclusion, significant barriers to inclusion, and if the programs have initiatives in place for greening their labs.

B. Survey Findings

Our first question was ‘Does your cultural heritage conservation/preservation department include sustainability topics in your curriculum?’ (Figure 1). If participants responded yes, they moved on to more detailed questions about the sustainability methods they employ. The majority of participants in the survey acknowledged having some sustainability concepts introduced in their classes, but to what extent this has been integrated is uncertain. It is useful to see the progress being made towards international consideration of these topics within cultural heritage. We next asked about the types of teaching materials being used (Figure 4). Most respondents incorporated a variety of the suggested materials and methods, which included exercises/activities, required reading, assignments, guest lectures and site visits. Workshops, addenda to class discussions and incorporating tips from campus sustainability teams were some other responses mentioned.

Figure 1. Bar graph visual depicting results from survey question: ‘How does sustainability play a central role in your course curriculum?’, graph courtesy of UCLA Digital Archaeology Lab.

The third question asked whether topics are integrated into courses or taught as a separate course. Of those who answered this question, 68.8% indicated that they are integrated, while 10.4% taught as a separate course, and 16.7% selected ‘other’. The ‘other’ category was principally explained by sustainability being offered as both integrated and as a separate course.
The fact that so many participants have sustainability concepts interwoven is heartening, as the direct applicability of sustainable practice is clearly present in preservation discussion. Assuring that these discussions are actively integrated avoids marginalizing the topic as a separate facet of students’ education. This question was followed by an inquiry about subcategories of sustainability included in curricula, in which respondents could choose multiple responses (including examples of each for more clarity) (Figure 2). Environmental sustainability was the most popular response, but social, cultural and economic sustainability were not far behind in their incorporation. The co-dependency of these subcategories makes them difficult to teach as separate topics for discussion, which is evident from the results of the survey.

Figure 2. Bar graph visual depicting results from survey question: ‘Which of the following subcategories of sustainability do you discuss in relation to your curriculum?’, graph courtesy of UCLA Digital Archaeology Lab.

All respondents were offered a fifth question, which asked ‘Does your department plan to include more sustainability education in your program in the future?’ with options for ‘yes’, ‘no’, or ‘I don’t know’. Those who affirmed the program’s intent consisted of 54.7% of respondents, with 14.7% negative responses and 30.5% uncertain. At this point in the survey, we asked all respondents about institutional barriers to incorporating sustainability (Figure 3). We asked for commentary and received the following quotes drawn anonymously from the survey:

One barrier is just that the curriculum is already very tight and so integrating any new material is always a matter of pieces rather than unified chunks.

Lack of time to embed sustainability as a topic in curriculum. Plenty of interest in principle from the institution, but simply no staff/time resources to add the subject into the existing structure.
Conservation is steeped in traditional practices. Staff may be set in their ways and not know newer methods or be eager to adopt more sustainable techniques. This prevents them from teaching it to their students.

![Circle chart visual depicting results from survey question: ‘Have you experienced barriers to incorporating sustainability into your program?’](image)

Figure 3. Circle chart visual depicting results from survey question: ‘Have you experienced barriers to incorporating sustainability into your program?’, graph courtesy of UCLA Digital Archaeology Lab.

While more than half of the respondents indicated that they include sustainability, it is clear that many of those who have and have not incorporated sustainability came across opposition to prioritizing its inclusion. In securing a unified focus on testing and developing materials that address sustainable practice for inclusion in curricula, it seems that bureaucratic politics at universities can be a major barrier to buy-in. Another concern was the static quality of the field and its preference for tried-and-true methods. Perhaps in managing risk we should consider the pit-falls of not making changes to material choices and approaches to heritage preservation. The difficulty lies in finding ways to support tradition while also staying relevant with current needs of our planet and our students.

Our last curriculum question asked all respondents whether or not programs are greening their labs (with request for commentary) and we received many positive and innovative responses. 58.9% responded ‘yes’, 18.9% indicated ‘no’, 11.1% selected ‘I don’t know’, and 11.1% selected ‘not applicable’. The most common responses in the commentary were reducing waste and using eco-friendly alternatives with ten mentions each. Other popular responses were incorporating greener solvents (6), reusing materials (6), and proper hazardous waste disposal (5).

This survey corresponded with our interviews with sixty-five educators and cultural heritage practitioners who have demonstrated a transdisciplinary approach to sustainability in cultural heritage. Some of these connections were made through researching resources on the subject.
and others were a result of our survey outreach. Of these many interviews, some recurring themes included the following: a necessity for integration of concepts as part of a larger cultural heritage ecosystem; using practical challenges involving expense, time and availability of materials to build decision-making skills; and incorporating a future-facing outlook in developing skills for adaptation. Some also mentioned the need to evaluate what we consider ideal treatments and to rethink the life expectancy of materials. There is strong agreement that students are driving many of the projects in a sustainable direction through their choice of research topics and suggesting safer alternatives for treatments.

IV. ANALYSIS (Pathways)

A. Traditional Ecological Knowledge Integration

One of the projects that is working to bring traditional knowledge back into cultural heritage conservation is “Our Ancestors Knew Best,” which focuses on preserving and storing textiles using traditional methods from Southeast Asia, including plant-based cleaning solutions and insect mitigation strategies (Brennan, et. al, 2020). Collecting this information from elders of Indigenous communities is a way of preserving both tangible and intangible aspects of cultural heritage to grasp the spiritual aspects as well as the efficacy in removing soil and particulate matter that is acidic and harmful without introducing toxins.

Plants native to the area have been cultivated and harvested for testing and have been found to be effective for treating various textiles based on their fiber content, and a collaboration has been formed between the project team and our UCLA/Getty conservation program faculty and staff to continue this research in the United States and Canada. While all treatments need to be weighed and not all will be valid for use in a conservation lab setting, adapting these methods to the needs of museums is a worthwhile application.

The inclusion of multiple perspectives is a necessary part of cultural heritage conservation, especially with its inherent interdisciplinarity. Many higher education institutions in countries with histories of colonization are promoting the implementation of intellectual and cultural traditions of Indigenous peoples within other disciplines. This would serve to “further support students and employees and to increase understanding and reciprocity among Indigenous and non-Indigenous peoples” (CiCan, n.d). In 2013, the Colleges & Institutes Canada (CiCan) developed the Indigenous Education Protocol to actively support building relationships based on respect and reciprocity among Indigenous and non-Indigenous people. An example of a successful case is reflected in the Kinàmàgawin Report from Carleton University in Canada, which focuses on “learning together with open hearts and open minds” (Kinàmàgawin, 2020).

B. Greener Lab and Practices

Conservation labs are unique spaces within their organization that often require specialized methods for resource savings. These can include purchasing energy efficient freezers and installing recirculating water systems for the lab’s DI water tap. Reducing hazards and removing
toxic waste properly are all familiar ways of working in labs for safety reasons, but can also aid in more sustainable lab operation. However, there are many methods applicable to non-laboratory spaces that can also reduce waste and energy in lab spaces, such as remembering to turn off bench lights, wiping down benches with reusable cloths (for non-chemical circumstances), and using materials economically to minimize waste.

Through partnership with Sustainability in Conservation (SiC), the UCLA/Getty Conservation Program and the Getty Conservation Institute (GCI) are both participating in a project to produce resources and test greener solvent alternatives on a number of materials. We plan on working with the students to build this research into their projects based on the media focus currently being explored. Through this opportunity, they will gain hands-on experience studying chemical interaction between the media and substrate, as well as evaluating qualities of these materials, such as their life cycle assessment, chemical composition, toxicity levels, and disposal methods. The GCI will also be hosting a meeting on Green Chemistry in collaboration with SiC, which will enrich the students’ awareness of strides in the field toward limiting use of toxic materials in conservation practice.

V. STRATEGIC GOALS AND RECOMMENDATIONS

A. Implementation

The next step in reaching our important goals is to more fully understand the barriers against thinking and working sustainably within cultural heritage. Our preliminary work has revealed to us that most conservators support sustainability goals, yet they struggle to find ways to revise their practice. By convening partners and performing research to fully understand these barriers, UCLA/Getty faculty are committed to disambiguating how to value sustainability alongside more traditional conservation standards of care.

What is then needed is the development and implementation of new approaches to teaching and learning. Active learning through tabletop and scenario exercises can be a more effective and engaging approach to bring in sustainability as a cross-cutting theme within the existing curricula. These exercises and activities will be field-tested in our program for both in-person and online settings. We will bring in consultants, both academic and from within the conservation field to aid and guide in the development of these materials. Consultants would include experts in educational frameworks for sustainability learning, early developers of sustainability pilots for graduate conservation programs, and experts in higher education Indigenous knowledge frameworks and pedagogy.

Additionally, the partnership between our program and another graduate conservation program would be advantageous for both teams to assess the effectiveness of utilizing these models under different circumstances. The Education for Sustainability framework highlights the need for a more holistic and global approach to sustainability literacy, rather than traditional transactional teaching methods that fail to engage systems thinking and problem solving aspects of action learning and hands-on project-based activities. This method puts the power of decision making in the learner’s hands.
B. Impact

By recruiting these participants, we anticipate our team will bring in effective strategies for student engagement, learning and empowerment. The skills that result from this participatory approach will be useful for affecting change in their future workplaces and for their positive influence within their networks. The goal is for sustainability to be recognized as more than a trend, but as a challenge that requires collaborative and creative efforts to overcome obstacles and unsustainable practices. By establishing these decisive goals and learning outcomes, this will influence the design of our content and teaching methods to orient and guide in both the implementation and assessment of embedding Education for Sustainable Development (ESD).

Watching this design plan take hold internationally through the efforts of UNESCO, ICCROM, and many other cultural preservation organizations leads to greater expectation of the critical role ESD can play in conservation education. These value-centered approaches provide a learning context for individuals to critically reflect and analyze their own decisions, question the way systems operate in unsustainable and traditional ways, and find their role and sphere of influence as future change-agents.

C. Dissemination

By following sustainability competencies such as systems thinking and future thinking that are largely independent of particular topics in the larger sustainability realm, these concepts should be applicable in most cultural heritage contexts. Focusing on core messaging in simple or modular exercises will provide other educators the latitude to manipulate and scale these activities to their needs. Concrete materials and resources would be made available on an open-access web platform where downloadable content is malleable and integrative for various skill building and knowledge components of conservation modules. They would be applicable for both practical and theoretical courses, with emphasis on the heightened role of preventive methods, collaborative enterprises, and sustainable decision-making practices.

There are many resource websites, such as ICCROM’s Our Collections Matter, which aggregate tools and guides relating to the Sustainable Development Goals (SDGs) and affiliated projects (ICCROM, 2021). Our connections and partnerships with Climate Heritage Network, the AIC Sustainability Committee, and Ki Culture would also aid in promoting and circulating our website content. Additionally, we have compiled a mailing list of parties interested in following the progress of our research. Presenting at conferences, engaging on social media, and collaborating on initiatives with common goals ensure we remain a part of the dialogue during the dissemination phase of this project.

D. Recommendations

Sustainability is about action before there is a need for reaction and the time is ripe for students in all disciplines to approach all problems through this lens. In higher education, teaching sustainably is a valuable model that should be perceived throughout the entirety of a course, so that the message is amplified through a multitude of scenarios, cases, and practical applications.
Currently it is common for courses to include a separate module or discussion period on sustainability, so the challenge is seeing some of the more subtle ways it pertains to other modules, either through environmental, social, or economic concerns.

In cultural heritage preservation, the stabilization of materials is acting as a catalyst to sustain that culture’s material past. However, we need to be ensuring that the intangible aspects are present through communication with source communities who may carry on artistic techniques to the present, and contextualizing the utilitarian aspects and continuing effects these objects have for their cultures. Students should consider the current systems of cultural heritage storage, transport, display, and renovation in light of their effects on our planetary boundaries, resource depletion, and unseen effects material consumption has on local and global communities. Seeing the whole picture allows for a broader understanding of past injustices, current inequity, and future consequences of the decisions being made in the cultural heritage sector.

Putting this into practice in course preparation, learning outcomes should reflect foundational methods alongside innovative solutions being proposed to further the field. Students should feel like they are a crucial part of this shifting practice and can learn to balance environmental, social, and economic needs of a system. Reviewing existing course competencies alongside those recommended for teaching sustainability is helpful in finding ways to interweave the concepts so that the material is not added onto the activities, but rather informs and enhances the discussion. Framing lectures and activities in terms of their future impact also provides a sustainable framework for considering future generations in decision-making for the well-being of people, culture, and planet.

VI. CONCLUSION

Cultural heritage conservation graduate programs are looking for effective ways to expand research and initiatives centered around sustainable practice. The key ingredient here is in finding ways to instill a systems rethinking and redesigning through reflection on past traditions. The way collections are stewarded should be based on accountability of tangible heritage storage and display, and co-authorship of cultural narratives to preserve intangible aspects of heritage. Procurement practices should be highlighted for environmental sustainability as well as social responsibility of purchasing local and from non-exploitative companies.

In the classroom space, co-learning spaces are accessible and collaborative, openly reflecting respectful dialogue and sharing of ideas between peers and between professors and students. Discussions revolving around global issues and systemic practices will help center the conversation around the need for inclusion of all perspectives to consider planetary finite resources and equitable preservation of culture as interconnected components. Interweaving sustainability topics within conservation discourse will help frame the complexity of the challenges we face to sustain the field and model resilience.

We are grateful to the National Endowment for the Humanities for investing in our efforts to date.
APPENDIX A: STRATEGIC PLAN

A. Mission & Vision

Climate change is no longer looming on the horizon, but is present in social, cultural, economic, and environmental aspects of our lives. Especially given the threats we face of changing weather patterns, rising tides, and longer storm and fire seasons, this new normal requires action on the part of conservators. Issues involving the disappearance of culturally relevant sites and monuments in disaster-prone areas continuously affect marginalized societies, especially those who do not have the financial capacity to prevent future catastrophe and adapt to the changing landscape. Conservation of cultural heritage has a heavy carbon footprint with plastic-lined housings, objects transported long distances, and tightly climate controlled storage spaces. Cultural heritage conservation is the field that protects and preserves cultural heritage for the future, so we must recognize the impact our work has on the environment this culture and its source communities inhabit.

Museums can reflect the past while envisioning a future where the needs of the environment, the economy, society, and culture exist in a balance. Sooner rather than later, conservators will be called upon for their resilience and adaptability in conserving heritage for highly vulnerable regions and communities. Cultural heritage conservation has until now been western-centric and excluded BIPOC and communities associated with museum collections. Finding ways to make tangible culture stable and accessible to source communities is the current and future role of the conservator, which means also preserving crucial intangible elements.

UCLA/Getty Conservation’s mission is to be a leader in educating a new generation of conservators and conservation scholars, who will carry practical, holistic, and adaptable skills into their institutions and private practices. They will feel empowered to make ethical and cost-saving decisions by sharing a common understanding and language in working with facilities managers, sustainability officers, and other specialists in building and environmental sustainability. Through embedding sustainability, the resulting practices will become natural and reflexive approaches to materials testing, environmental controls, and treatment plans, considering the health of colleagues and planetary boundaries.

Our program’s associated values include emphasizing collaboration, sustainability, diversity, equity, and inclusion. Conservators play an essential role in making positive change toward climate and social justice issues. Their training in both scientific analysis and the humanities are instrumental for building bridges between disciplines and fostering dialogue between communities. This shift in focus in the classroom presents an opportunity to rethink our systems and meet new challenges the field is facing.

B. Objectives

Our aim is to develop pedagogical models and materials that embed sustainability in cultural heritage conservation education. The findings from our research conducted during this Tier I NEH Research and Development project somewhat altered our strategies to reach this aim. We had originally designed a two-phase strategy. The first was to conduct needed research, and the second was to design, field test, and produce curricular materials to incorporate into our own
program and share with international educators in cultural heritage conservation, including in graduate programs, undergraduate programs, short courses, and workshops.

A major finding in our research was that students, faculty, and practitioners in the field encounter barriers to integrating sustainability into all phases of conservation education and practice. We now believe that further research is needed to understand these barriers prior to the development of the curricular models and materials. This additional research is phase-two in what is now a three-phase project.

C. Scope of Phase II

Phase II activities—for which we are requesting NEH support for the Research and Development phase—will build upon Phase I groundwork via the following:

Year One: Targeted research and outreach to collect and document new data on barriers; development of ways to overcome barriers through experimental pedagogy with practitioners and consultants;

Year Two: Analysis of data and evaluation by partners of methods trialed to overcome these barriers; and,

Year Three: Final development and evaluation of pedagogy to address these barriers, project reporting, dissemination, and publication.

The primary research question that we propose to address in this phase is: what types of barriers exist at all levels of the field, including within academic programs, that prevent or slow down the integration of sustainability into the practice of conservation and its pedagogy? From our Phase I research we learned that regardless of whether respondents wanted to incorporate sustainability into their work, many faced opposition or institutional resistance to prioritizing its inclusion—from bureaucratic politics at universities, to the static quality of the field and its preference for tried-and-true methods, to the realities of institutions lacking sufficient conservation funding, equipment, and access. We also found systematic exclusion of sustainability in most of our own teaching. There was a strong agreement in our survey and interview data that students and young professionals are driving many of the projects in a sustainable direction through their choice of research topics and suggesting safer alternatives for conservation procedures. Senior conservators, faculty, and their institutions are not supporting the integration of sustainability into research and practice. Conservation educators and professionals need more resources to incorporate this framework into their work.

Phase II will enable us to augment our work with a range of global conservation educators, practitioners, and students, as well as consultants in sustainability and education, to understand, identify, and address the type of barriers that exist within the field; develop, test, evaluate, and disseminate theoretical and practical models to address these challenges; and ultimately, work towards fully embedding sustainability in academic and professional heritage conservation understanding and practice.

D. Scope of Phase III

For Phase III, which we hope to commence in fall 2026 once funding is secured, we will take practical steps to disseminate a complete graduate-level pedagogy. This final phase will include outreach and training and seeks to significantly impact the future preservation of and access to humanities collections around the world.
APPENDIX B: REFERENCES


APPENDIX C: SUSTAINABILITY WEB RESOURCES & PUBLICATIONS

Annotated Bibliography

All over the world the best design and creative minds are dedicating themselves to waste and how to get rid of it by transforming the way we design, use and dispose of stuff. There are some great examples of how the circular economy can be applied in design and fashion worlds, but circular economy principles and practice are still relatively unknown and unexplored in the arts and culture sector. This webinar gives you a better understanding of the circular economy and how you can apply its principles in your areas of work, from artistic practice to day-to-day operations in organizations.

This paper reviews the incorporation of diverse forms of traditional knowledge in conservation research by the Borobudur Conservation Office (BCO), Indonesia. Research undertaken by the BCO relied on both social and natural scientific approaches. Traditional knowledge was acquired in consultation with traditional custodians and the properties of selected traditional materials were scientifically studied and adapted for use in a conservation context. These outcomes of collaborations with traditional custodians and the findings of scientific investigations have been embedded in the BCO’s written and multimedia publications, as well as their training and research programs. It is argued that these efforts could promote sustainable conservation practices by providing alternative, biodegradable conservation materials. Furthermore, these efforts are viewed as a model for conservation best practice; in a community that emphasizes cross-cultural engagements.

In a time of unprecedented transformation as society seeks to build a more sustainable future, education plays an increasingly central role in training key agents of change. This book asks how we can equip students and scholars with the capabilities to promote sustainability and how the higher education curriculum can be changed to facilitate the paradigm shift needed. Elaborating key principles of higher education for sustainable development and identifying drivers and barriers to implementing sustainability in the curriculum, the book provides a comprehensive overview of what makes higher education for sustainable development a unique field of research and practice, as well as offering a coherent narrative of how change can be affected in it.

Traditional methods of textile preservation in Southeast Asia incorporated Indigenous knowledge of plants and their natural chemical attributes to make detergents, preservatives, pest deterrents and pesticides. Textile conservation methods evolved away from these sustainable, environmentally friendly practices, as modernization spread and synthetic chemical alternatives became globally available. As we look towards more local sourcing to support human activities, it
is important for modern conservators to record traditional knowledge, identify plants and apply traditional practices where possible in their own conservation work. This is the first project to research and quantify traditional methods of textile preservation in Southeast Asia. As conservators, the knowledge and practices of our ancestors and elders underpin continued growth in our conservation practice. This project is the start of forming a textile conservation practice in the region, combining aspects of unique Indigenous knowledge with imported empirical data from Europe and elsewhere.


Recent years have witnessed a surge in field-wide discussion about how to talk openly about race and culture within museum education. This article provides an analysis, using case studies from three culturally specific museums to explore how these identity-driven institutions navigate challenging, and often controversial, approaches to discussing race and identity. Key findings reveal important lessons for all museum professionals and include recognizing biases, addressing language and ambiguities explicitly, partnering with community members, and inviting visitor dialogue.


This paper presents an evidence-based model (the I3E model) for embedding education for sustainability (EfS) within a higher education institution. This model emerged from a doctoral research that examined organizational learning and change processes at the University of Southampton to build EfS into the university curriculum. The researcher aimed to learn from real practice through acting as a facilitator for curriculum development in EfS within an interdisciplinary group of academic staff members. A critical friend position was also acquired within a community of practice to implement a programme which attempted to embed sustainability within the student experience. The I3E model identifies four overarching components that can support universities in their aim to embed EfS within the undergraduate curriculum. These integrated components are: Inform the university community about sustainability; Engage the different university stakeholders in the change process towards sustainability; Empower individuals and groups to make change happen within their sphere of influence and action; and Embed sustainability within existing university structures.


This paper provides a review of the current literature that examines the uptake of sustainability policies in higher education. Articles were retrieved from both ERIC and Scopus databases and then manually reviewed to ensure that they focused on each of: higher education; sustainability; and policy. A total of 91 articles were analyzed using a multi-stage process that involved sorting data according to typologies (i.e. temporal, terminology, methodology, geography), coding the text of the articles based on topical content, and an indexing method used to label data for further analysis and the development of broader code categories. Results suggest that drivers and barriers associated with the integration of sustainability policy in higher education are well known; yet increased research is needed to understand best practices and processes by which sustainability can be furthered through higher education policy. In addition, findings demonstrate
the need for future research to focus on various aspects of the policy process, including policy development and enactment, and on implications of policy for practice. While there have been some reviews of sustainability policy in higher education research to date, this review contributes to this literature by highlighting research primarily focused on sustainability policy within higher education.


Narratives about the history of collecting are commonly absent from the interpretation of natural history collections. In this paper, we argue this absence – particularly in relation to colonial histories – perpetuates structural racism within modern society by whitewashing a history where science, racism, and colonial power were inherently entwined. This misrepresentation of the past is problematic because it alienates non-white audiences. Using examples from a single natural history collection – the Natural History Museum, London (NHM) – we will demonstrate how an existing collection retains these colonial ideologies and narratives, and, as such, can be used at the centre of decolonial approaches to interpreting natural history collections. We propose that publicly acknowledging difficult pasts is an important first step in creating less racist museum interpretation in natural history museums.

In Gokcigdem, E. M. (2019). Designing for empathy: Perspectives on the museum experience. Designing for Empathy is a volume of twenty-five essays contributed by multidisciplinary and museum thought leaders, collectively exploring the state of empathy for its design elements that might lead to positive behavior change and paradigm shift towards compassionate worldviews and actions. As museums are currently shaping their tools for fostering empathy as an intentional outcome of museum experiences, the idea of empathy-building is shaping them back as socially relevant institutions that increasingly value diversity, accessibility, and equality. This is a non-linear, multi-layered, and multi-dimensional transformation that requires multidisciplinary, cross-industries, and cross-sectors alliances for its sustainability.

Kimmerer, R. W. (2013) Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teaching of Plants. Botanist and member of the Citizen Potawatomi Nation, Kimmerer has been trained to ask questions of nature with the tools of science, while embracing the notion that plants and animals are our oldest teachers. Braiding Sweetgrass brings these lenses of knowledge together to show that the awakening of a wider ecological consciousness requires the acknowledgement and celebration of our reciprocal relationship with the rest of the living world. For only when we can hear the languages of other beings are we capable of understanding the generosity of the earth, and learning to give our own gifts in return.


This paper introduces foresight methodologies and their application to conservation with particular focus on environmental scanning. Organized into two parts, the first section of the paper describes case studies of environmental scanning activities undertaken by the gallery, library, archives and museums (GLAM) sector. It argues that as a profession we are poorly represented in discussions about the future of collection materials and the means for its preservation. It outlines recommendations as to how an environmental scanning capacity might best address these concerns and be implemented to serve the Australian conservation community. The second part deals with the underlying principles of foresight as a discipline, specifically with the process and

This article takes a look at some of the broader themes of value creation that have evolved as part of a circular economy, and illustrates why chemists should (as well as exemplifying how they could) get involved. We begin by outlining five main lessons we have learned since the Ellen MacArthur Foundation was set up in 2010, and then proceed to talk about two concrete examples where the circular economy offers a vision of a system with positive socio-economic and environmental outcomes: mobility and plastics. In each case, we discuss the role chemistry, in particular green chemistry, can play – anchored in the realization that chemists play a central role in guiding society towards its material future.


Thinking in Systems, is a concise and crucial book offering insight for problem solving on scales ranging from the personal to the global. This essential primer brings systems thinking out of the realm of computers and equations and into the tangible world, showing readers how to develop the systems-thinking skills that thought leaders across the globe consider critical for 21st-century life. Some of the biggest problems facing the world—war, hunger, poverty, and environmental degradation—are essentially system failures. They cannot be solved by fixing one piece in isolation from the others, because even seemingly minor details have enormous power to undermine the best efforts of too-narrow thinking.


There has been limited research into the role of reconstruction in the preservation of Indigenous Australian archives, both those created within Indigenous communities, and those created about Indigenous people. Following a phenomenological methodology in which the research question is contested against real world experience, two case studies investigate the potential of reconstruction as a methodology in the conservation of Indigenous Australian archival material and the contexts in which it is created and used. First, a comparative analysis of metadata and documentation practices at the Warlayirti Artists’ Center archive in Balgo, Western Australia, outlines the role of conservation in supporting the reintegration of access to artist-run archives. Second, an interview with the artist Brook Andrew documents how contemporary Indigenous artists create their own archives to disrupt received notions of identity, and to articulate the archival continuum into which contemporary Indigenous identity develops. This study develops a model of reconstruction to provide theoretical and practical guidelines for understanding the relevance and role of archives, and the significance of archival re-appropriation by Indigenous artists. This paper argues that, in supporting and enabling the process of reconstruction, conservators can work with Indigenous Australian artists to sustain their cultural past and collective memory in different material forms into the present.
Heritage Conservation and Social Engagement explores different kinds of engagement, participation, access, and creative use of resources motivated by the practice of conservation, and offers ethical and practical perspectives from which to approach cultural heritage projects. The chapters are structured around the themes of engagement and participation, with an emphasis on the value of cross-disciplinary collaborations and the adoption of more encompassing approaches to conservation decision-making. The authors explore the complexities of these collaborations, which are often influenced by the colonial baggage of museums and whose effectiveness varies according to context, objectives, methods and resources available. Efforts to promote inclusion and engagement through museum collections and the broader heritage sector are becoming even more socially relevant, as in recent years we have observed a rise in intolerance towards minority groups in traditionally democratic societies. The heritage sector is responding strongly, as it has the tools to help fight prejudices that are invariably based on misinformation or manipulation of facts. This book joins these efforts, in the knowledge that nothing can be done without dialogue and engagement.


The climate change variables of temperature, relative humidity, rainfall and fire weather are used in conjunction with spatial methodologies to produce maps that overlay locations of Australian national, state and regional cultural heritage collections with climate change risks. The data analysis of these maps is evaluated in relation to the biological risks of insect pests and mold using published studies and recent observations. Mapping both the distribution of cultural heritage collections and potential environmental impacts allows for future risks to collections to be modeled, producing an evidence base for identifying future priorities for conservation. An historical study of the development of arts policy and conservation guidelines in Australia places the investigation of changing climate and risks within a broader national cultural heritage context. In understanding how Australian cultural heritage collections, and the conservation profession more broadly, might become more sustainable and resilient, the use of environmental guidelines in conjunction with predictive climate mapping resources is recommended.


In the general global rise of attention and research to seek greener attitudes, the field of cultural heritage (CH) makes no exception. In the last decades, an increasing number of sustainable and biologically based solutions have been proposed for the protection and care of artworks. Additionally, the safety of the target artwork and the operator must be kept as core goals. Within this scenario, new products and treatments should be explored and implemented in the common conservation praxes. Therefore, this review addressing metal heritage is aimed to report biologically derived gel formulations already proposed for this specific area as reliable tools for cleaning. Promising bio-gel-based protocols, still to be implemented in metal conservation, are also presented to promote their investigation by stakeholders in metal conservation. After an opening overview on the common practices for cleaning metallic surfaces in CH, the focus will be moved onto the potentialities of gel-alternatives and in particular of ones with a biological origin. In more detail, we displayed water-gels (i.e., hydrogels) and solvent-gels (i.e. organogels) together with particular attention to bio-solvents. The discussion is closed in light of the state-of-the-art and future perspectives.

In 2017 the AICCM received a Community Heritage – Peak Organizations grant from the NSW Office of Environment and Heritage. With funding for two years the AICCM and its project partners, Bathurst Regional Council and the Grimwade Centre at the University of Melbourne, trialed a new locally-led model of community conservation which links conservation students and graduates with local communities in rural and regional Australia. This paper reviews the outcomes of the programme in terms of its ability to demonstrate how, with appropriate support, the promotion and preservation of local cultural heritage can inspire community programmes, provide novel loci for educational activities, generate social and economic benefits, and demonstrate regional leadership. Initial findings indicate that the project provides a demonstration model for an expanded national conservation program to begin to address one of the key, but as yet under-examined, recommendations of the 1975 Pigott Report.


In Doughnut Economics, Oxford academic Kate Raworth identifies the seven critical ways in which mainstream economics has led us astray - from selling us the myth of 'rational economic man' to obsessing over growth at all costs - and offers instead an alternative roadmap for bringing humanity into a sweet spot that meets the needs of all within the means of the planet. Ambitious, radical and thoughtful, she offers a new, cutting-edge economic model fit for the challenges of the 21st century.


In this paper, I explore museum asset transfer, a process whereby community organizations take responsibility for managing and governing museums that local governments previously managed. Museum asset transfer has increased since austerity policies were introduced in the UK following the global economic crisis. I offer a two-part introduction to museum asset transfer. Part 1 is a timeline of policies and political developments informing museum asset transfer, answering the question 'how did we get to where we are now?' In Part 2, with reference to interviews and ethnographically informed data taken from my PhD research into this topic, I identify common challenges experienced by local government employees and community members during the asset transfer process. The article concludes with a reflective discussion of the negotiation of my own positionality within the research, specifically the question of how to translate research findings on policy-related topics into publications and initiatives devised for non-academic audiences.


In January 2016, the World Economic Forum and the Ellen MacArthur Foundation, with analytical support from McKinsey & Company, launched the report The New Plastics Economy – Rethinking the future of plastics at the World Economic Forum in Davos. For the first time, the research provided the vision of a global economy in which plastics never become waste. The report, financially supported by the MAVA Foundation, was the result of a collaborative effort involving more than 40 participant companies and cities across the global
plastic packaging value chain. It was produced as part of Project MainStream, and led by the CEOs of nine global companies. The report acknowledges that, while plastics and plastic packaging are an integral part of the global economy and deliver many benefits, their value chains currently entail significant drawbacks.

Thomas, L. (2022). The Intersectional Environmentalist: How to Dismantle Systems of Oppression to Protect People + Planet. New York: Voracious Books, Little Brown and Company. The Intersectional Environmentalist is an introduction to the intersection of environmentalism, racism, and privilege, and an acknowledgement of the fundamental truth that we cannot save the planet without uplifting the voices of its people. Thomas shows not only that Black people, Indigenous people, and people of color are unequally and unfairly impacted by environmental injustices, but that the fight for the planet lies in tandem with the fight for civil rights; in fact, one cannot exist without the other. This book addresses the most pressing issues that our planet and the people on its face, examines and dismantles privilege, and looks to the future as the voice of a movement that will define a generation.


The archaeology of post-industrial landscapes is still relatively undeveloped. The impact of economic, social, and urban development efforts on both tangible and intangible heritage complicate our attempts to understand these places. Despite this, integrating heritage practice and promotion into the regeneration of a postindustrial landscape continues to grow in popularity. Within this context, genuine public-expert collaboration is the most effective means towards developing a sustainable compromise between protecting community heritage values and fostering economic development and regeneration. In this paper, we suggest three broad categories of challenges for studying and promoting heritage in postindustrial regions – physical, social, and political – and propose a digital data-focused geospatial approach to how community archaeologists and heritage specialists may overcome these challenges. We argue that coupling this data and technology with a robust research agenda and public programming can serve as a crucial two-way link, enabling long-term sustainable heritage-promotion and protection in post-industrial communities.


Regardless of strong political support for the development of sustainability literacy amongst the UK graduates, embedding sustainability in the higher education curriculum has met with widespread indifference, and in some cases, active resistance. However, opportunities exist beyond the formal curriculum for engaging students in learning about sustainability. Previous research has highlighted the potential of the university campus for experiential, place-based learning about and for sustainability. This has been conceptualized as the ‘informal’ curriculum, consisting of extra-curricular activities and student projects linking estates and operations to formal study. However, the impact of the so-called ‘hidden curriculum’ (the implicit messages a university sends about sustainability through the institutional environment and values) has been overlooked as a potential influence on student learning and behavior. This article reports on a small-scale research project which utilized a phenomenographic approach to explore students’ perceptions of the ‘hidden sustainability curriculum’ at a leading sustainability university. The findings suggest that helping students deconstruct the hidden campus curriculum may enhance aspects of sustainability literacy; developing students' understanding about sustainability and creating solutions to
sustainability issues, enabling evaluative dialogue around campus sustainability and also self-reflection, which could be transformative and translate into pro-environmental behavior change. This research is transferable to other contexts.

Conferences & Publications

Archives Supporting Environmental Sustainability. (2021). The National Archives. Virtual Conference. (Link forthcoming)


