

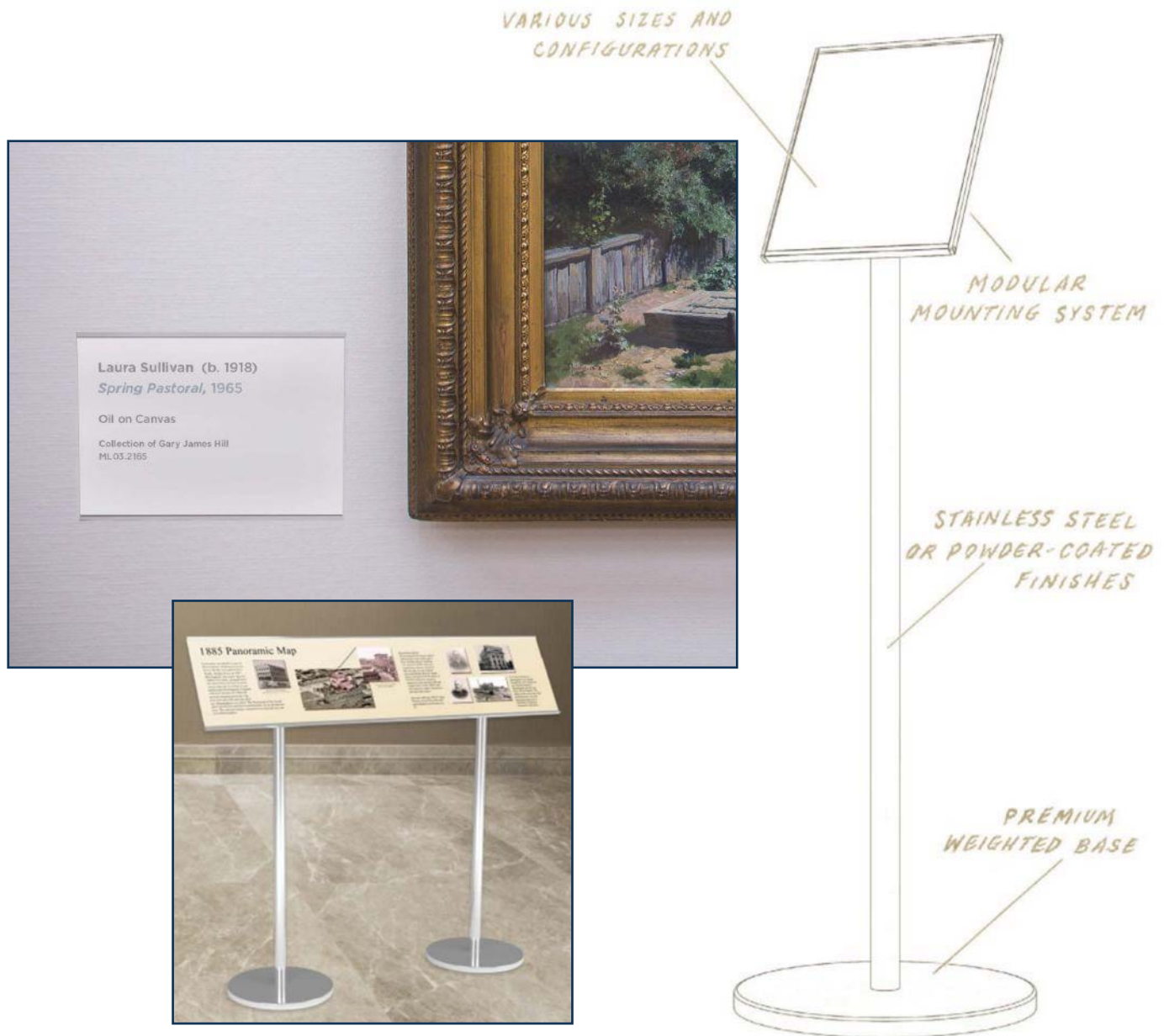
STEWARDSHIP
EQUITY
ACTION +
REGENERATION

MUSEUM

CLIMATE
CHANGE



INFORMATIVE. SLEEK. ALWAYS DISCREET.



MuseumSigns is one of the most discreet and versatile signage systems available. Our sleek, low profile anodized aluminum signage plates and label holders are the perfect complement for showcasing your exhibits or guiding the visitor experience. Various sizes and configurations include wall mounted, floor mounted, freestanding and longer reader rail options.

MUSEUMSIGNS.COM

800.862.9869



NY NOW

August 14-17, 2022
Javits Center, NYC

NEW

Trends. Directions. Products.



market.nynow.com/AAM

Register Today!

JULY
AUGUST
2022
ISSUE

CONTENTS



FEATURES

- 20** Doing Our Part
Museums can simultaneously make their exhibitions more sustainable and improve social equity.
By Douglas Flandro, Cecile Shellman, and Jeff Baker
- 26** Climate Change at Home
At King Manor, education about the environment and the historic house go hand in hand.
By Kelsey Brow
- 32** Bringing Our Resources to Bear
Academic museums can use their institution's resources to educate about the climate crisis.
By Natalie Marsh and Kristina Durocher
- 38** Protecting Earth's Heart
Monterey Bay Aquarium is doing its part to keep the effects of climate change from further affecting ocean health.
By Claudia Pineda Tibbs
- 44** Let's Go All In
The international climate conference makes clear that we all must do our part to slow the climate crisis.
By Patrick Hamilton

Cover:
The Eclipse,
Alma Thomas,
Smithsonian American Art
Museum, gift of the artist

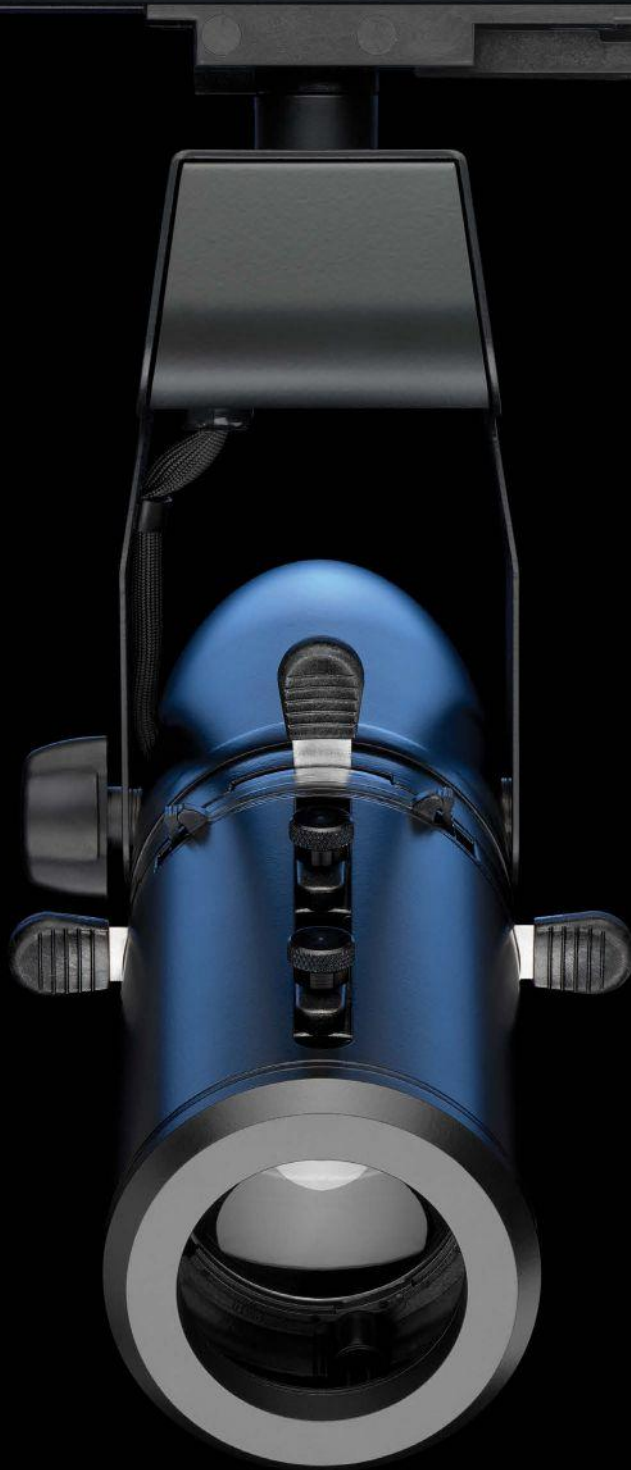


DEPARTMENTS

- 5** From the President and CEO
- 6** By the Numbers
- 7** First Look
- 11** Correction from the Editors
- 12** Point of View
Think Globally, Act Locally
- 16** Point of View
Ending Business as Usual
- 48** Reflection

Museum magazine serves as a forum for the museum community to share its ideas, perspectives, and experiences related to magazine themes. A call for submissions is held throughout the year. **For more information, visit** bit.ly/museumeditorial.





BPM	LED IMAGE PROJECTOR	120/277V
	12" Length, 19 watts, 15,000+ CBCP	Beam Angles From 20° to 60°
	3 Plane Shutters	Glass or Metal "E" Size Gobo
<p>The BPM Series is a petite, architecturally designed LED image projector. At 12" in length, the BPM is a high performance instrument with 15,000+ CBCP at 19 watts. To learn more about the long list of professional grade features of the BPM Series, please visit our website.</p>		
<p>Lighting Services Inc The premier specialty lighting manufacturer.</p>		

Lighting Services Inc

800 999-9574 www.LightingServicesInc.com



MUSEUM

A BENEFIT OF MEMBERSHIP IN THE AMERICAN ALLIANCE OF MUSEUMS

EDITOR IN CHIEF

Dean Phelus

MANAGING EDITOR

Gayle Bennett

CONTRIBUTING EDITORS

Ember Farber, Rachel Lee, Joseph O'Neill, Cecelia Walls

DESIGN AND PRODUCTION

Team of Creatives, LLC

ADVERTISING

Carol Nettles
aamad@adboomadvertising.com
404-347-1755

ALLIANCE PRESIDENT AND CEO

Laura L. Lott

ALLIANCE BOARD OF DIRECTORS

OFFICERS

Chair (2020–2023)

Chevy Humphrey, Museum of Science and Industry, Chicago

Vice Chair and Secretary (2022–2023)

Jorge Zamanillo, National Museum of the American Latino

Treasurer (2022–2023)

Devon Akmon, Michigan State University Museum and Science Gallery

Immediate Past Chair (2020–2023)

Kippen de Alba Chu, Independent Museum Executive

TERM OF OFFICE 2020–2023

Carrie Reborra Barratt, LongHouse Reserve

Frederic Bertley, Center of Science and Industry

Alison Rempel Brown, Science Museum of Minnesota

Christine A. Donovan, Northern Trust Company

Charles L. Katzenmeyer, Field Museum

TERM OF OFFICE 2021–2024

Dina Bailey, Mountain Top Vision

Carole Charnow, Boston Children's Museum

Ann Friedman, Planet Word

Linda Harrison, The Newark Museum of Art

Julissa Marengo, Smithsonian Institution

Nathan Richie, Golden History Museum & Park

Karol Wight, Corning Museum of Glass

TERM OF OFFICE 2022–2025

Marcia DeWitt, Hillwood Estate, Museum and Garden

Julie Stein, Burke Museum of Natural History and Culture

MUSEUM (ISSN 0027-4089)

JULY/AUGUST 2022, VOLUME 101, NO. 4

PUBLISHED BIMONTHLY (J/F, M/A, M/J, J/A, S/O, N/D)

BY THE AMERICAN ALLIANCE OF MUSEUMS

2451 CRYSTAL DRIVE, SUITE 1005, ARLINGTON, VA 22202; 202-289-1818; FAX 202-289-6578; WWW.AAM-US.ORG.

Annual subscription rate is \$38. Copies are mailed to all members. Single copy is \$7. Overseas airmail is an additional \$45. Membership in the Alliance includes \$22 from annual membership dues applicable to a subscription to MUSEUM, except for students and retirees. (This notice is required by the US Postal Service.) POSTMASTER: Send address changes to MUSEUM, 2451 Crystal Drive, Suite 1005, Arlington, VA 22202. Copyright 2022, American Alliance of Museums. All rights reserved. No part of this magazine or its cover may be reproduced without written consent of the copyright proprietor. MUSEUM is indexed in The Art Index, which is published quarterly and available in public libraries. The magazine is available from ProQuest in the following formats: microform, electronic and paper. Opinions expressed by contributors are not necessarily those of the Alliance. Preferred Periodical postage paid at Arlington, VA, and additional mailing offices. Printed in the US by Lane Press, Burlington, VT.



twitter.com/aamers



facebook.com/americanmuseums



linkedin.com/groups/American-Alliance-Museums-2965314



instagram.com/aamersofficial

Thanks to our Member Discount Providers



HUNTINGTON T. BLOCK
INSURANCE AGENCY, INC.



Meeting the Climate Change Challenge

AAM's vision is “a just and sustainable world informed and enriched by thriving museums that contribute to the resiliency and equity of their communities.” I am constantly impressed and inspired by how museum professionals embody this aspiration.

For instance, I recently had the privilege of presenting Kristen Greenaway, President and CEO of the Chesapeake Bay Maritime Museum, with the National Maritime Historical Society's Distinguished Service Award. One of the many impressive accomplishments that earned her the award was her work on the museum's sustainability initiatives. The museum has been building toward several ambitious goals, including eliminating single-use plastics across its campus, composting all food waste, and educating visitors on sustainable best practices they can adopt themselves. Kristen believes that, with a mission so closely tied to waterways, the museum has a responsibility to lead the way on keeping them clean and healthy.

An increasing number of museums are treating environmental sustainability as an essential part of their missions, too. As the evidence grows that urgent action is required, it's not only science museums and nature centers emphasizing the issue, but also those with less obvious parallels, like art museums and historic houses. Across the spectrum, Alliance members are stepping up to do their part, looking both inward and outward in the process.

Museums have at least two roles to play in fighting climate change: one in examining and reducing their own carbon footprints and another in educating the public on the issues and what they can do to make change. The work must be holistic, demonstrating a real commitment to sustainability and encouraging that commitment from others at the same time.

Climate change is nothing if not a holistic issue, one that intersects with many more problems than meet the eye. The United Nations' Sustainable Development Goals, for instance, prioritize not just steps like reducing food waste and adopting clean energy sources, but also reducing inequality and enhancing public services around the world. A growing climate justice movement acknowledges that while climate change

impacts everyone, it disproportionately impacts some, like people of color, Indigenous groups, young children and older adults, and the economically insecure.

In other words, climate change is a complex issue, with many different entry points to understanding and action. Because of that, all museums can find a way into it that is suited for their unique missions and circumstances. How each museum responds will be different, but we all have a responsibility to do so as part of our commitments to serving the public good.

This complexity, while empowering in one sense, can also feel overwhelming. The scale, gravity, and intricacy of climate change can be so hard to fathom that we adopt an all-or-nothing attitude and refrain from acting at all. We can't let this happen. In the face of such a daunting problem, the answer is always to start somewhere.

As your Alliance, we will help you find essential resources to achieve greater sustainability, whether you're just starting out or advancing an existing initiative. After reading about the inspiring work of your peers in this issue, we hope you will continue your journey by consulting some of the other resources available through our website, such as the Climate Toolkit, which we've partnered with Phipps Conservatory and Botanic Gardens Conservation International to distribute. The toolkit adapts the UN's goals into specific measures that museums, gardens, and zoos can take. For ongoing, peer-to-peer discussions, you can join our Environment and Climate Network, where you will find a rich community of museum professionals discussing how their institutions can be at the center of climate solutions. We hope all of this empowers you to do the great work you're capable of, and we look forward to hearing about it soon.

5/4/22



Laura Lott

Laura L. Lott is the Alliance's president and CEO. Follow Laura on Twitter at [@LottLaura](https://twitter.com/LottLaura).

Environmental Sustainability

57%

Percentage of museum-goers who think it is “very” or “extremely” important for museums to be on the forefront of educating the public about climate change.

5 out of 6

Museum-goers who think all museums need to reduce their carbon footprint or be more sustainable.

92%

Percentage of museum-goers who think at least some museums should educate the public on climate change.

Source: 2022 Annual Survey of Museum-Goers by AAM and Wilkening Consulting

By the Numbers was compiled by Susie Wilkening, principal of Wilkening Consulting, wilkeningconsulting.com. Reach Susie at Susie@wilkeningconsulting.com.



Courtesy of Bay Area Discovery Museum; Francis De Erdely, *Daily Bread (Bluebird)*, n.d., image courtesy of Spencer Jon Helfen Fine Arts, Beverly Hills, CA; artwork copyright the artist, photo courtesy of MAM

Bay Area Discovery Museum

Located in the Golden Gate National Recreation Area, the Bay Area Discovery Museum applies the latest research in early childhood learning to interactive activities and environments. Olson Kundig’s renovation of the historic Fort Baker maintains the architectural integrity of the site while also enhancing the visitor experience with dynamic new exhibits across its expanded footprint. The renovation leaves room for future expansion to strategically position the museum for longevity and long-term resilience in the decades to come.

Location: Sausalito, CA

Learn more:
bayareadiscoverymuseum.org

Laguna Art Museum

“Striking Figures: The Work of Francis De Erdely” presents the artist’s social realist paintings of everyday people as a way of addressing issues of race, culture, and social strata in Southern California. The exhibition will highlight De Erdely’s timeless ability to depict the simple grace of common people, such as musicians, dancers, laborers, and social outsiders. His depictions are historical documents of the period, expertly painted with a poignancy that remains relevant today.

Location: Laguna Beach, CA

Dates: through Oct. 23

Learn more:
lagunaartmuseum.org/exhibitions/striking-figures-francis-deerderly

Missoula Art Museum

“Brian Maguire: In the Light of Conscience,” the artist’s first exhibition in a US museum, draws attention to marginalized voices and human rights atrocities on large canvases. This exhibition unites several recent bodies of work from his travels around the world. Bombed-out buildings depicted in dripping paint characterize his Aleppo series from 2017, and other paintings reference immigration and refugee crises, border crossings, and drug wars in Mexico.

Location: Missoula, MT

Dates: through Aug. 13

Learn more:
missoulaartmuseum.org/exhibits/brian-maguire-in-the-light-of-conscience



National Building Museum

“Notre-Dame de Paris: The Augmented Exhibition” is a 360-degree augmented reality immersion into the history of the cathedral and its ongoing restoration. To navigate the exhibition, each visitor will use a HistoPad™, a touch-screen tablet developed by the French startup Histovery, to provide an interactive tour transporting visitors back in time to the cathedral being built in the Middle Ages to the coronation of Emperor Napoleon I to the iconic Viollet-le-Duc spire being erected.

Location: Washington, DC

Dates: through Sept. 26

Learn more:
nbm.org/exhibition/notre-dame-de-paris-the-augmented-exhibition

The Museum of Jewish Heritage—A Living Memorial to the Holocaust

“The Holocaust: What Hate Can Do” offers an expansive and timely presentation of Holocaust history told through personal stories, objects, photos, and film—many on view for the first time. The 12,000-square-foot, long-term exhibition features over 750 original objects and survivor testimonies from the museum’s collection.

Location: New York, NY

Learn more:
mjhny.org/exhibitions/the-holocaust-what-hate-can-do/

Upcountry History Museum

“Vietnam: The Real War Photography from the Associated Press” features 50 gripping photographs that document the hard realities of war as seen through the lenses of some of the best photojournalists sent to Saigon by AP to cover the conflict. Organized by AP and the Huntsville Art Museum, this exhibition tells the human story of the impacts and tragedies of a long and divisive war that profoundly shaped American history.

Location: Greenville, SC

Dates: through Aug. 20

Learn more: upcountryhistory.org/exhibitions-events/changing-exhibits/vietnam-the-real-war-photographs-from-the-associated-press

Histovery, gift of Betty Lenz, Yaffa Eliach Collection, donated by the Center for Holocaust Studies; AP Photo

The Alliance wishes to thank these corporate partners that have generously supported this year's *TrendsWatch*



TrendsWatch

MUSEUMS AS COMMUNITY INFRASTRUCTURE



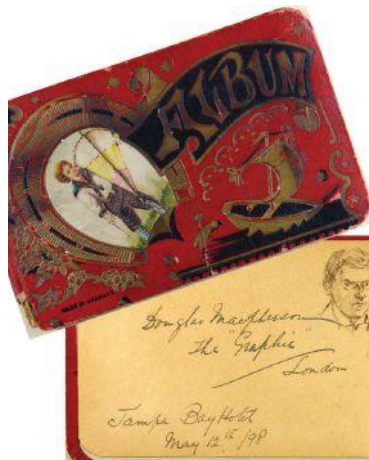
 Center for the Future of Museums

TrendsWatch: Museums as Community Infrastructure, the 2022 edition of the annual Alliance's annual forecasting report, is now available.

Download your free copy!

<https://bit.ly/trendswatch2022>





Frederik Meijer Gardens & Sculpture Park

Designed by Tod Williams Billie Tsien Architects | Partners, the new 69,000 square-foot Welcome Center enhances the arrival, admission, and overall experience for guests of Frederik Meijer Gardens & Sculpture Park. The building is part of a \$115 million expansion project that responds to significant growth in attendance and programming since the organization opened in 1995.

Location: Grand Rapids, MI
Learn more:
meijergardens.org/growing/

Henry B. Plant Museum

“Stop the Presses! Fake News and the War of 1898” explores yellow journalism and the work of famous war correspondents. The exhibition showcases the role played by small-town and rural newspapers, the Black press, and other media in balancing coverage of the US military intervention in Cuba. Their affirmation of the Fourth Estate offers a timely reminder that, despite concerns over the negative impact of social media and “fake news,” professional journalism remains integral to our society.

Location: Tampa, FL
Dates: through Dec. 23
Learn more:
plantmuseum.com/exhibits/current-exhibits/stop-the-presses

Susquehanna Art Museum

In March 2022, the Susquehanna Art Museum (SAM) and Verizon revealed a special new 5G cell site in Harrisburg. The new 5G pole outside SAM features custom artwork designed by local artist Stephen Michael Haas. This first-in-the-nation collaboration is part of Verizon’s arts program to help beautify local communities.

Location: Harrisburg, PA
Learn more:
susquehannaartmuseum.org/press/

What’s New at Your Museum?

Do you have a new temporary or permanent exhibition, education program, partnership/initiative, or building/wing? Tell us at bit.ly/MuseumNewsAAM, and it might be featured in an upcoming issue.

Michael Moran; autograph book, 1898, Henry Plant Museum; photo by Verizon

CORRECTION FROM THE EDITORS

The original version of “A Time for Transformation” in the March/April 2022 issue of *Museum* stated: “What can we conclude from the findings of the Wave 2 Culture Track survey? Audiences are still hurting and are looking to cultural organizations to help them feel better and connect them to one another. Given this, cultural institutions may be entering a new phase of identity that we call the ‘empathetic museum,’ which is characterized as a place of respite, comfort, and connection. The welcome extended to all groups is at the core of this construct; inclusion and authentic community representation and participation are essential components for the empathetic museum to foster meaningful connections.”

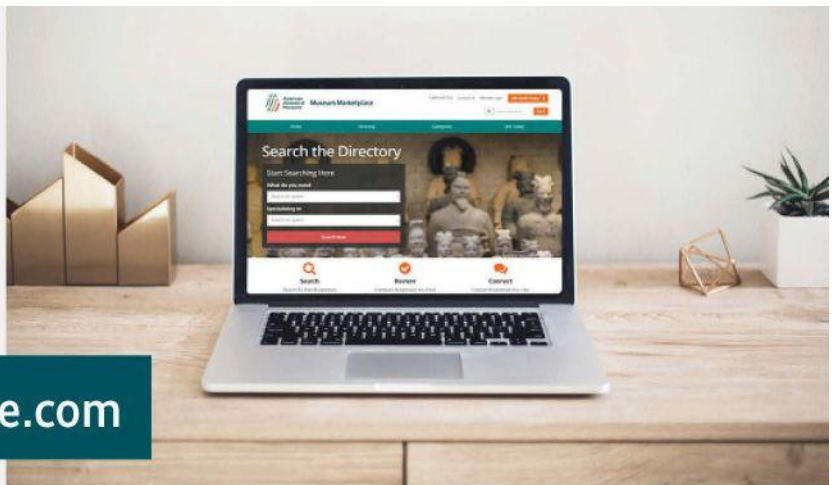
The author’s reference to the “empathetic museum” and a lack of corresponding citations suggest the term is original to the author of this article. This was not the author’s intent, and we recognize and apologize for AAM’s oversight in the editing process. The Empathetic Museum, with its downloadable Maturity Model, was established and has been in practice since 2013. The model is widely known and used in the field.

The editors and author submit this rewritten text in consultation with The Empathetic Museum:

“What can we conclude from the findings of the Wave 2 Culture Track survey? Audiences are still hurting and are looking to cultural organizations to help them feel better and connect them to one another. Given this, cultural institutions may be employing new techniques and models of practice to become more empathetic, characterized by respite, comfort, and connection. The welcome extended to all groups is at the core of this practice; inclusion and authentic community representation and participation are essential components for a museum or other cultural organization to foster meaningful connections. An example of this approach can be found in the Maturity Model and accompanying resources of The Empathetic Museum.”

Choose from
over 100
providers on

» [MuseumMarketplace.com](https://www.museummarketplace.com)



Head to a **one-stop-shop** to search companies that offer products and services to help museums operate smoothly. Search by location, or by dozens of categories—from design to displays, from sanitization to construction.



American
Alliance of
Museums

2451 Crystal Drive, Suite 1005
Arlington, VA 22202 | aam-us.org



Think Globally, Act Locally

By focusing on sustainability, museums can also help make their communities more just and equitable.

By Joyce S. Lee

According to the

Institute of Museum and Library Services, the US has about 35,000 museums. In 2019, these facilities were responsible for an estimated 12 million annual metric tons of greenhouse gas emissions, and that doesn't even account for museum transportation or embodied carbon, which includes the manufacturing, transportation, installation, maintenance, and disposal of building materials. That is the equivalent of 2.6 million cars on the road, according to the Carbon Committee of

AAM's Environment and Climate Network.

Operating in a sustainable manner is not just good for the environment, it's a matter of social justice. The Robert Wood Johnson Foundation's work on mapping life expectancy shows that our health, both mental and physical, depends more on our ZIP code than our genetic code. Residents in communities within a few miles of each other could have life expectancies that vary by up to 20 years because of the difference in place-based risks, such

as the levels of particulate matter, lead, microplastic, or other toxic chemicals.

Museums can help build a more just and equitable world for everyone inside and outside their walls not just by serving as active learning venues but also by operating their facilities in environmentally sustainable ways.

Justice from the Outside

Museums are place-based institutions, and their actions can positively or negatively reinforce what is occurring in



Your Hands Shimmering on Legs of Rain mural by Eurhi Jones and Michael Reali; title quote from Philadelphia poet Sonia Sanchez

Photograph by Michael Reali

their communities. For example, a transit-rich community helps with scope 3 emission scoring (see “Scoping Out Emissions” sidebar at right for more information on scope 1–3 emissions). A museum with an electric vehicle, bicycle, or pedestrian-friendly infrastructure provides cleaner air to the surrounding neighborhood. A museum that hosts community supported agriculture (CSA) distribution can help alleviate food deserts, which are areas that lack grocery stores that sell fresh fruits and vegetables.

Museums also provide important exhibitions and programming that deepen understanding, facilitate dialogue, and foster empathy. These are the very tools that can help community residents prepare for and recover from the stress of climate events, such as a flood, drought, or wildfire. These tools also raise the awareness of environmental degradation, prevalence of diseases, and health burden in disadvantaged communities.

Justice from the Inside

Indoor air quality is just as

SCOPING OUT EMISSIONS

An organization’s greenhouse gas (GHG) emissions are classified into three scopes:

- **Scope 1** emissions are direct GHG emissions that occur from sources that are controlled or owned by the museum (e.g., emissions associated with building operations and vehicles).
- **Scope 2** emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.
- **Scope 3** emissions come from indirect activities that occur in the museum’s operations, such as emissions related to employee travel, commuting, waste disposal, and purchased goods and services.

important as outdoor air quality because we spend the majority of time inside. While conservators tend to be in greater contact with chemicals, all those working inside museums can benefit from lower emissions. The side effects of toxic substances and carbon emissions are associated with asthma, diabetes, heart disease, and cancer.

Museums that strive to have healthy buildings should invest in long-term monitoring of substances ranging from carbon dioxide,

particulate matter, total volatile organic compounds, and formaldehyde at a minimum. A close collaboration between conservation, exhibition, and facility staff can simultaneously lower climate risk and enhance human health.

An institution investing in healthy buildings is also one pursuing environmental social governance (ESG) goals for its visitors and employees. ESG is becoming a more prevalent business practice, as evidenced by the March

RESOURCES

Anacostia Community Museum’s Urban Waterways
anacostia.si.edu/urban-waterways

The Wild Center’s Youth Climate Program
wildcenter.org/our-work/youth-climate-program/

The Wright Museum’s Treeposium
thewright.org/about/sustainability/treeposium

The Field Museum’s Edible Treasures Garden
fieldmuseum.org/science/conservation/greener-field/greener-field-edible-treasures-garden

Climate Week publications
aam-us.org/wp-content/uploads/2020/07/Museumbooklet_2021_final_highres.pdf
aam-us.org/wp-content/uploads/2020/07/MuseumBooklet_2020_final_highres.pdf

2022 proposal from the Securities and Exchange Commission (SEC) that all public companies report at least their scope 1 and 2 emissions and disclose their climate risks in their registration statements and periodic shareholder reports. If corporate investors care about such risk profiles, museum donors will soon ask—if they aren't already—for similar risk reporting. The largest intergenerational wealth transfer in history will usher in a younger generation of donors more likely to be attuned to environmental issues.

After two years of the pandemic, equitable access to clean air cannot be overemphasized for museum workers and visitors. It is now clear that investing in improved air ventilation, filtration, and the building envelope will benefit not just the museum collection and employees but the public at large.

Museums and Climate Week

The Environment and Climate Network (ECN) at AAM helps museums become leaders in environmental stewardship, sustainability, and climate action. Every September, ECN participates in Climate Week, which coincides

with the United Nations General Assembly, the annual gathering of global heads of state in New York City.

During the past two pandemic years, ECN transitioned to virtual programming during UN Climate Week, which allowed broader participation. For example, in 2020, Cecilia Lam of the Jockey Club Museum of Climate Change in Hong Kong and Jenny Newell of the Australian Museum shared how they have engaged their communities in climate action. Museums have a head start in environmental justice when they have community programming in their DNA.

In 2021, Andrés Roldán of Parque Explora in Colombia and Leonardo Menezes of the Museum of Tomorrow in Brazil both articulated the challenges of transforming the museum culture to embrace this new climate reality. “Climate change is not another layer of action but it increasingly becomes a part of the mission on how it is reframing culture, the objective, and how institutions measure their own value,” said Roldán. Those challenges were reinforced by two other guests

on the program, Francis Morris of the Tate Modern in England and Massimo Bergamini of the Canadian Museums Association, who emphasized that addressing the social and equity aspects of climate change are equally critical.

Museum operations can be energy, water, and waste intensive, but if museums adopt innovative environmental strategies with a social justice lens, they will be part of the climate solution. Emerging from the pandemic, the adage “think globally and act locally” applies more than ever to museums.

Joyce Lee, LEED Fellow, FAIA, WELL AP, is the president of IndigoJLD, which provides green health consultancy, design, benchmarking, and planning services. She was recently appointed as the inaugural commissioner by the mayor of Philadelphia on the Environmental Justice Advisory Commission. She serves as the chair of the AAM Climate and Environment Network and can be reached at info@indigoJLD.com.

HOW TO GET STARTED

Following are some tips for getting started on your environmental programming.

1. Invite the sustainability officer for your city or from a local university to speak at the museum during Climate Week and/or Earth Day.
2. Conduct a review of the museum's utility bills and benchmark your energy using the Energy Star Portfolio Manager (energystar.gov/buildings/benchmark).
3. Engage youth and schoolchildren in creating museum climate web pages.



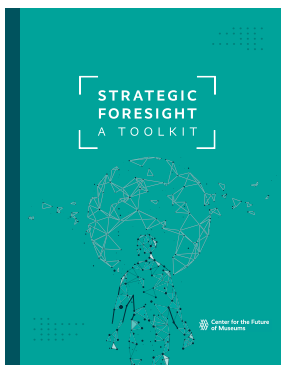
NEW from AAM's Center for the Future of Museums

This new resource is packed with worksheets, games, and exercises, providing a comprehensive introduction to strategic foresight—a vital skill set that enables individuals and organizations to anticipate change, craft effective plans, and shape the future they want to see.

Use this toolkit for:

- Professional development
- Staff enrichment
- Board education
- Strategic planning
- Creative brainstorming sessions
- Building connection within teams
- Livening up meetings

Strategic foresight provides a powerful assist to strategic planning, identifies critical risks and opportunities, and helps leaders avoid being blindsided by disruption. Develop “futures literacy” in yourself and your team to feed informed and thoughtful planning and decision-making.



Download your toolkit today

Nonmembers: \$60

AAM Members: \$50

<https://www.aam-us.org/programs/toolkits/strategic-foresight-toolkit>





Ending Business as Usual

With a regenerative approach, every museum can address climate change.

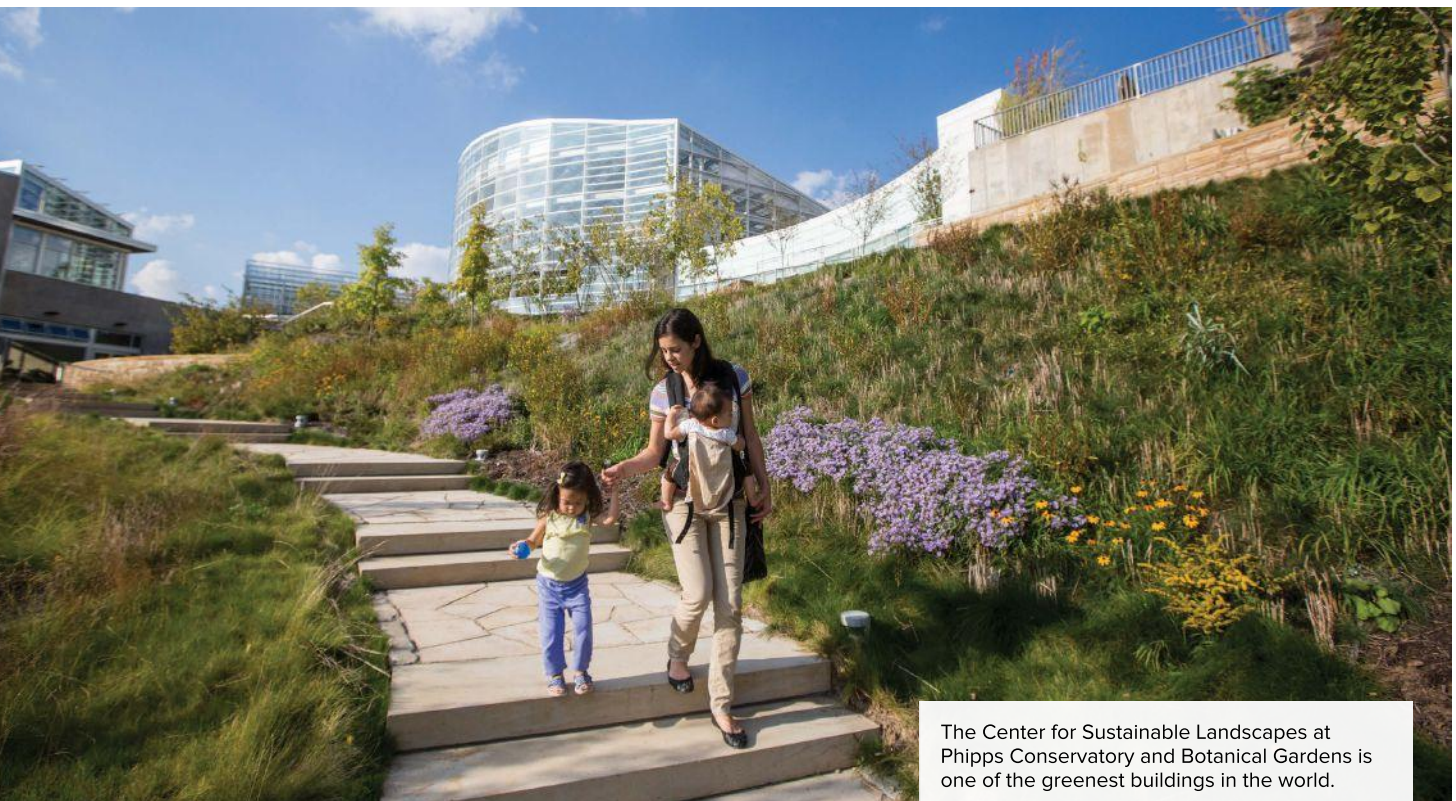
By Richard V. Piacentini

Not so long ago many in the museum world felt that if our mission didn't explicitly include concern for the environment and climate change, we were off the hook. Attending to such concerns was a form of "mission creep," and environmental initiatives were best led by environmental organizations.

But times have changed, and they have changed rapidly: climate change is real, advancing at an alarming rate and affecting everyone and everything on the planet. Today, the trust that we have established in the communities we serve and our decades of commitment to the exploration of science, history, art, and nature compel us

not only to address these issues but to be the leaders of change in our regions and beyond.

At the annual United Nations-sponsored Climate Change Conferences, countries make pledges based on the proposition that the whole country will work to meet specific, measurable goals. The US has pledged to cut carbon



The Center for Sustainable Landscapes at Phipps Conservatory and Botanical Gardens is one of the greenest buildings in the world.

Annie O'Neill

emissions in half by 2030. Is your museum on track to help the US meet this commitment? Do you know what actions your museum will need to take to achieve such a goal?

In 2018, the Stockholm Resilience Center released a study related to the UN’s 17 sustainable development goals. The study recognized that while many organizations had voiced support for those goals, no one had studied the best ways to achieve them. Using various models for different levels of action (and inaction), the study found that only “bold, transformational policies” would keep us out of the red zone for planetary distress.

In other words, business as usual isn’t good enough anymore. As Albert Einstein famously said, “No problem can be solved by the same kind of thinking that created it.” We need to adopt bold, transformational thinking and change the way we see, consider, and interact with the world. Regenerative thinking can show us how.

What Is Regenerative Thinking?

In her work, author and educator Carol Sanford describes four paradigms for how we interact with the world. The **extractive** model is all about “me”; the individual in this model sees the world as fragments that are there for the taking and is either unaware or doesn’t care who or what they hurt to get what they want. In the **less bad** model, we see a shift in thinking from “me” to “us”; an individual in this paradigm

still sees the world as fragments but now tries to stabilize them and reverse some of the bad. This is where the environmental movement started. The **do-good** model is also about “us” but recognizes reciprocity; an individual in this model sees the world as fragments and tries to improve it and project that vision of what good looks like on others. The final paradigm is **regenerative**; it is about “us” and seeing the world as an interconnected and nested system, a series of relationships that we have with each other, other species, and the planet. This is how many Indigenous communities think.

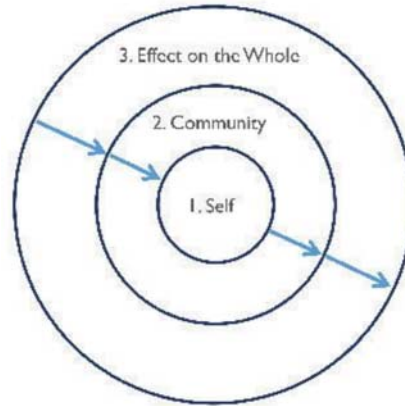
Respecting those relationships is key to creating harmony and allowing each entity to develop to its highest capacity based on its own individual essence—the set of qualities, values, experiences, and characteristics that make a person, a community, a bioregion, or an institution unique and non-displaceable within the systems they inhabit.

We can be most effective when our organizations and the communities we serve follow a regenerative approach in which individuals move beyond thinking about themselves in isolation and see the larger social and natural systems that we collectively need to survive.

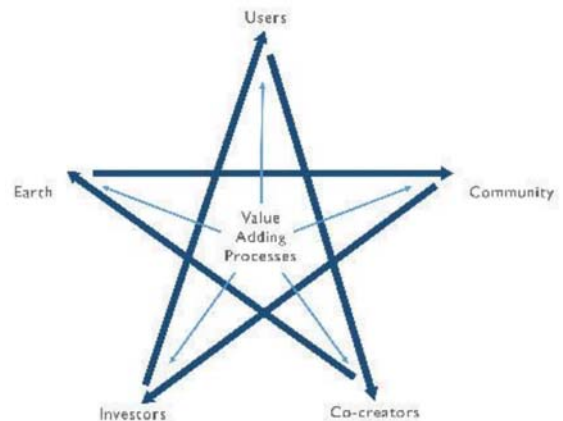
New Thinking in Practice

To guide our practice of regenerative thinking at Phipps Conservatory, we use several frameworks: two particularly useful examples are the Living

System Transformation: Three Lines of Work



Living Systems Stakeholders



Source: Carol Sanford

Systems Stakeholders and Three Lines of Work, shown above.

Each framework reminds you of the larger systems in which you operate, to make a fuller accounting of the effect of your actions as they ripple from system to system, and to fine-tune your thinking to ensure that your work is value-adding, capacity-building, and life-sustaining.



FIRST PRINCIPLES OF REGENERATIVE THINKING

Carol Sanford defines the following seven “First Principles of Regeneration” to guide one’s way of viewing the world.

- See the world as **wholes** rather than fragments.
- Initiate with **potential** instead of focusing on problems.
- Recognize **reciprocity** and that we live within living, dynamic, nested systems where we have reciprocal, mutually beneficial interactions with the larger and lesser systems in which we are nested.
- Exhibit singularity, or **essence**, recognizing the non-displaceable uniqueness of everyone and everything on the planet.
- Recognize **nestedness**, understanding that we are embedded within larger and lesser systems.
- Think of work as **nodal**, and seek interventions at the point of highest systemic return.
- Seek growth and **development** of the capacity in everyone to reach their highest potential based on their own essence.

The Living Systems

Stakeholders framework helps define success by recognizing five distinct stakeholders: investors (or donors); users (visitors and people who engage with your programming); community; co-creators (staff, volunteers, suppliers); and the planet. In regenerative thinking, rather than focusing on just one of these groups, we aim to add equal value to all five stakeholders in everything we do.

The Three Lines of Work

framework helps expand our impact by visualizing our operations at three levels. In the center, we focus on ourselves and becoming proficient in what we do. At the second level we focus on the organization, getting out of our departmental and operational silos and understanding how we support the organizational mission in collaboration with others. At the third level, we focus on community and

what we can do to support positive and developmental change.

Taking Action

So, what can you do to address climate change? Change the way you measure and define success to encompass broader impacts, longer-term goals, and a more holistic group of stakeholders. Learn from others what you can do to change how you operate. As you begin to see how you can make changes, start thinking about how you can continue to develop the capacity of your organization and community to make important changes based on the unique essence of your organization, community, and bioregion. Every region will experience climate change differently, so learn the areas of greatest effect for your community and tell that version of the story. Your audience will find more to relate to and their involvement will deepen.

To help you get started, Phipps Conservatory, in partnership with AAM and Botanic Gardens Conservation International, created the Climate Toolkit, (climatetoolkit.org), a collaborative



The Climate Toolkit
climatetoolkit.org

Carol Sanford, *The Regenerative Life: Transform Any Organization, Our Society, and Your Destiny*, 2020

Carol Sanford, *Indirect Work: A Regenerative Change Theory for Businesses, Communities, Institutions and Humans*, 2022

UN Sustainable Development Goals
sdgs.un.org/goals

Stockholm Resilience Centre, *Transformation Is Feasible*, 2018
bit.ly/38GiAuh

opportunity for museums, gardens, zoos, and other cultural institutions worldwide to share information, mentor one another, and learn how to aggressively address climate change and inspire the communities they serve to follow their lead. The toolkit embraces 31 goals for addressing climate change within the categories of energy, food service, water, transportation, waste, landscapes and horticulture, investments, internal and external engagement, and research.

The toolkit is built with the understanding that every institution, community, and bioregion is different, and each institution will

have to prioritize the areas that make the most sense for them to address. Your journey may start out from a less bad paradigm, but as you adopt initiatives you are encouraged to think regeneratively in developing new essence-based initiatives for both your institution and community.

Once you start using a regenerative way of thinking, everything shifts: not only will you be better equipped to meaningfully address climate change, your new perspective will begin to add value, capacity, and life to everything that you do. Success will take on a new meaning, and your role as a leader in your community will grow.

There's no better time than now to begin this journey, and we look forward to taking it with you.

Richard V. Piacentini is president and CEO of Phipps Conservatory and Botanical Gardens in Pittsburgh, Pennsylvania. Since 1994, he has led the green transformation of Phipps Conservatory and Botanical Gardens operations, programs, and facilities based on regenerative thinking and recognizing the vital connections among people, plants, health, and planet.

Assess Your Assets

NOW AVAILABLE!

The General Facility Report (Updated Edition)

Document the latest information about your institution's physical specifications and staff practices through this updated standard report form.

An indispensable resource for your lenders, insurers, architects, designers and other pertinent partners.

COST: \$19.95 FOR NON-MEMBERS
\$9.95 FOR MEMBERS

To purchase the report, visit
<https://bit.ly/generalfacilityreport>

DOING

Museums can simultaneously make their exhibitions more sustainable and improve social equity.



By Douglas Flandro, Cecile Shellman, and Jeff Baker

OUR PART

These Expedition Blue information kiosks in Cape Cod, Massachusetts, are pursuing the International Living Future Institute's Core Green Building Certification, which looks at 10 core sustainability imperatives.



It has been six years since President Barack Obama declared a state of emergency in Flint, Michigan, a majority-Black community, due to highly contaminated water. Between 2014 and 2016, tens of thousands of Flint residents were exposed to lead-tainted water, resulting in illness and death.

This revelation and the subsequent mitigation efforts allowed many Americans, for the first time, to consider and examine the environmental harms and disparities that plague nonwhite people, largely because of systemic and institutional racism. Flint was but one jarring example of many that expose parallel but inequitable Americas.

The reality is that for decades, more people of color than white people have experienced the deleterious effects of lead, asbestos, toxic air, and other pollutants. Historically, law and tradition informed by prejudice and racism created practices that continue to be deeply problematic. What is sometimes ascribed to poverty alone has roots in racial injustice.

What does this have to do with museums? How we build new exhibitions affects sustainability and social justice in our communities and around the world. Until we, as a field, look critically at our own practices to see if we, too, are perpetuating harm, we will not be able to honestly take social responsibility and engage in collective healing.

Using Sustainable Materials

All museums can learn from what small museums already know: the best way to conserve limited resources is to design exhibitions so that elements can be disassembled and reused. Think “clips and screws, not nails nor glues.”

Cultivate mutually beneficial community partnerships. Some museums have partnered with local theaters or film boards to reuse plywood or other construction materials from former sets in their exhibits. Or you could also find materials at construction salvage warehouses.

The OH WOW! science center in Youngstown, Ohio, recently created an exhibit on mental health for kids. Using salvaged construction materials that included silk daisies, stuffed baby chick toys, a smiley face spatula, and yellow watering can, CambridgeSeven and museum staff created a large “Wall of Shine,”



Above: This wall at the OH WOW! science center was created from salvaged yellow objects that bring joy to the community members who donated them. Below: Instead of sending the old exterior signage to the landfill, the design team reused it in the gift shop.

which community members filled with yellow objects that make them happy. This exhibit successfully tackled both mental health topics and sustainable design opportunities. The museum also repurposed exterior signage in its new gift shop.

Many products will try to appear sustainable even though they are not. This is called “greenwashing,” and to navigate this disinformation your exhibit staff will need to learn sustainable material basics. The good news is that third-party certifiers have done much of this work for us (see the Resources box on p. 25 for a list of free sustainable building material databases), but it is important to learn which sustainable certifications are biased advertising and which are based on data.

Environmental product declaration (EPD) reports provide the energy use and carbon footprint of a specific product from extraction and manufacture

Lighting EUI

Jellies Gallery
Aquarium of the Aquariums
1-Apr-2022



	QUANTITY	INPUT WATTS	HOURS/DAY (1-24)	DAYS/WEEK (1-7)	% DIMMED	LPD (w/sq. ft.)	ANNUAL kWh	EUI (annual kWh/sq. ft.)
Work Light Fixtures								
1'x2' LED Vapor Tight Fixture (BOH)	10	40.0	12	5	25%	0.11	939	1.6
1'x2' LED Vapor Tight Fixture (FOH)	13	40.0	4	7	25%	0.15	569	1.0
Subtotal	23					0.26	1,508	2.5
Architectural Fixtures								
B Flosco Pica Cube (Banner Lights)	60	2.2	9	7	25%	0.04	325	0.5
C LSI Track Light	37	14.0	9	7	25%	0.15	1,276	2.1
O ETC Pattern Projector	18	14.0	9	7	25%	0.07	621	1.0
Subtotal	115					0.25	2,222	3.7
Exhibit Fixtures								
Aquallumination Prime HD	2	55.0	16	7	50%	0.03	321	0.5
Aquallumination Hydra 26 HD	9	95.0	16	7	50%	0.24	2,497	4.2
Aquallumination Hydra S2 HD	1	135.0	16	7	50%	0.04	394	0.7
Acolyte Backlyte	71	14.8	9	7	60%	0.30	1,378	2.3
Lumascap - Jelly Tank 1	9	19.0	16	7	50%	0.05	499	0.8
Lumascap - Jelly Tank 2	3	27.0	16	7	50%	0.02	237	0.4
BK Fixture - Jelly Tank 3	3	7.0	16	7	25%	0.01	92	0.2
Light Box - Jelly Tank 4	160	7.0	16	7	75%	0.32	1,635	2.7
Overhead Lumenpulse - Jelly Tank 4	20	7.5	16	7	50%	0.04	438	0.7
Subtotal	278					1.04	7,491	12.6
LIGHTING TOTALS						LPD (w/sq. ft.)	Annual kWh	EUI (annual kWh/sq. ft.)
						1.55	11,221	18.8

This spreadsheet is used to calculate the approximate annual energy usage for a particular lighting design. It incentivizes the use of motion and daylight sensors and the use of lower-power light fixtures.

through its useful life to disposal (cradle to grave). Health product declaration (HPD) reports are detailed, self-reported ingredient lists for building products. Ask your suppliers if they have EPDs and HPDs for their products.

Select materials from companies that have a long track record of sustainable practices and have examined their environmental and social justice impact. These companies tend to continuously improve their processes and treat their own employees well. Look for companies that have take-back programs in which they recycle their products at the end of their useful life.

In addition, look for the International Living Future Institute's "Just" certification label, which identifies the diversity and equity within organizations. Or seek out certified B corporations (B Corp), which are for-profit companies that have had the quality of their products, how they treat their employees, and their relationship with their communities examined by B Lab,

a third-party certifying agency. When possible, engage women-owned and minority-owned businesses.

The International Living Future Institute has a new simplified Core Green Building Certification that can be used to certify the sustainable aspects of your exhibition. Expedition Blue, a series of distributed-site information waypoints on Cape Cod, is pursuing this certification for one of its kiosks, which provides a place to enjoy beautiful views and fosters pride in the local, water-based "blue economy."

Reducing Energy Use

Reducing the energy use of exhibits can save institutions a lot of money. The first step, if you have not already done so, is to replace all incandescent light fixtures with LEDs in your museum. Many local governments and energy companies have excellent incentives to subsidize replacement costs, and the energy savings will quickly cover any remaining expense.

When designing new exhibition galleries, use a simple spreadsheet to track the daily watts used for each light fixture. With this data, you can calculate a gallery's lighting power density (LPD), which is the maximum energy load if all your lights were on at full power. Using the square footage of the building, you can also easily calculate the annual energy use intensity (EUI), which is measured in kBtu per square foot. The same spreadsheet can be used to quickly calculate energy use of audiovisual experiences. (See an example spreadsheet on p. 23.)

EnergyStar's national baseline for all energy used in museum galleries is 56 kBtu/sq. ft. Your museum can set a goal to never exceed this national average and to lower energy use in future exhibitions. To do so, install daylight and occupancy sensors so that you are only drawing energy for lighting when needed.

Finally, look for fixtures and audiovisual equipment that are compliant with Restriction of Hazardous Substances (RoHS), which indicates that they have been tested and certified to be free of 10 hazardous substances, including lead, mercury, and cadmium.

Sustainable Graphics Production

Over the past decade, printing methods have become much more environmentally sustainable. Gone are photographic chemicals and most solvents high in volatile organic compounds (VOCs). Eco-solvent inks use a base alcohol to replace aggressive solvents, UV printers cure inks with UV light rather than through out-gassing, and water-based latex inks are certified by GREENGUARD Gold, meaning they meet ambitious standards for chemical safety.

A sustainably minded graphic print supplier can increase environmental and community benefits by sourcing, testing, and employing locally manufactured and environmentally sustainable substrates. High-quality, high-performing roll-and-sheet products without PVC (see the PVC sidebar on this page) and containing both recycled and sustainably sourced material are available from Hewlett Packard, Monadnock Papers, Ultraflex, and Fisher, among others.

Ideally, your print provider will have a sustainability management system (SMS) in place. This operating framework encourages waste reduction and use of environmentally sustainable materials. It also

PVC: A SOCIAL EQUITY CASE STUDY

PVC, polyvinyl chloride, is a common plastic widely used in fabrication of large graphic wall murals and in expanded media boards. PVC is cheap, durable, long lasting, and ubiquitous. But its use is an example of how decisions of convenience can negatively affect communities with less power.

The manufacture of chlorinated polymers in PVC produces dioxins, which are among the most potent toxins known to humans. According to the Environmental Protection Agency (EPA), dioxins can pollute air and water, causing cancer, reproductive and developmental problems, damage to the immune system, and interference with hormones.

Research by ComingCleanInc.org found that the high-risk, or "fenceline," communities near these production plants are disproportionately BIPOC communities. According to a December 2019 EPA study, *Integrated Science Assessment for Particulate Matter*, race is the most significant predictor of a person living near sources of pollution.

encourages a system-wide sustainability approach involving energy use, carbon footprint, and other social and ecological impacts.

Even mounting substrates can be thoughtfully sourced. For instance, acrylic can be replaced with recycled-content resin sheet made from soda bottles. Plyboo or ApplePly are excellent alternative fabricating and mounting substrates.

Consider the following as you plan the image side of your exhibition:

- Determine a desired life cycle for your graphics. Some materials are more environmentally friendly than others, but you must strike a balance between quality and longevity. In some cases, a sign using slightly less eco-friendly, yet more durable, material may be a higher-value and lower-carbon solution if it will need to be replaced less often.

- Consider a modular design approach so that updating images and copy can occur with less material.
- Use print and mounting substrates with recycled and/or recyclable content. Some brand names that are completely non-PVC include PlyVeneer's BioBoard or PCA's Falconboard, Ex-Cel PVC Free Foam Sheets, Monadnock Envi Wallgraphics, or Cooley Group's EnviroFlex PE poster, banners, and translucent substrates.
- When possible, install graphics with mechanical fasteners as opposed to double-stick tape to eliminate volatile organic compounds (VOCs) associated with most adhesives.
- As you are thinking about carbon footprint, determine the manufacturing location of both the raw input materials (print material, inks, substrates) as well as the printer and fabricator. Many graphic products sold in the US are imported from other countries, thus involving much more transportation energy.

Setting Goals for Your Museum

After your exhibit design team learns the basics of sustainable products and environmental justice, identify the goals for your museum exhibits and future installations. Following are some questions to consider.

What levels of diversity will you seek in your internal team, in the people that you hire, and in your community partners? Who are the people making decisions about acceptable risks as you navigate price, convenience, durability, and equity?

How will you design for disassembly and incorporate salvaged materials into your work? What products will you seek to avoid for environmental justice or for visitor health? What are your energy use goals? What standards do you have for product durability? Even the lowest-carbon material has a higher carbon footprint than one that doesn't need replacing.

The hazardous environmental effects of climate change, although primarily caused by privileged communities in the global north, disproportionately affect BIPOC communities in the United States and in the global south. Any improvements to current practices

that reduce our carbon footprint can positively affect environmental justice.

This is challenging work that is sometimes difficult to navigate. Be patient with yourself in this journey, but do not let the complexity stop you from improving your internal practices. And as you strive to do better, use all your communication channels to share the story of your sustainability and equity work honestly and loudly to encourage others.

Douglas Flandro, LEED AP BD+C, ID+C, CPHC, is a museum exhibit designer and sustainable design leader at CambridgeSeven in Cambridge, Massachusetts. **Cecile Shellman** is a motivational speaker, author, and independent museum consultant whose work focuses on diversity, accessibility, inclusion, and anti-racism in museums. **Jeff Baker** is the founder and creative director of Image 4 environmental branding firm in Manchester, New Hampshire.

RESOURCES

Sustainable Minds Transparency Catalog

Lists of building products with EPDs and HPD transparency documentation
transparencycatalog.com

Mindful Materials Library

Extensive data about building products
mindfulmaterials.com

International Living Future Institute Declare Labels

Brief summaries of sustainable attributes of materials
declare.living-future.org

Cradle to Cradle Certification

Third-party certification of products focusing on safety, circularity, and responsible manufacturing
C2Certified.org

HomeFree Product Guidance

What to look for and what to avoid with interior building products and finishes
homefree.healthybuilding.net/products

CLIMATE CHANGE AT HOME

At King Manor, education about the environment and the historic house go hand in hand.

By Kelsey Brow

Photo by Brittany Lester, King Manor Museum



Neighbors from the Dawoodi Bohras of New York help prepare the garden beds at King Manor Museum for spring planting as part of Project Rise, a global initiative by the Dawoodi Bohras to improve access to education, health care, and nutrition while protecting the environment.



You might not think a historic house museum in Jamaica, Queens, in New York City would be a good place to learn about climate change. But at King Manor, we believe we are perfectly positioned to address this important and timely issue.

King Manor, which sits at the center of the only major green space in a bustling urban neighborhood and commercial center, interprets Rufus King's political legacy and antislavery history to teach critical thinking for a healthier democracy. King was a framer and signer of the US Constitution, a US Senator, an ambassador to England, and a vocal antislavery advocate. Also a dabbler in agricultural science, King improved his 160 acres of land, turning it into a successful working farm, using paid labor, and making scientific strides in the interest of the new nation's agricultural health.

A community-minded institution, King Manor, which employs three full-time and two part-time employees and has an annual operating budget just under \$300,000, regularly collaborates with local organizations and businesses and participates in initiatives that benefit the people in our neighborhood of Jamaica and wider New York City.

According to the 2020 census, 18 percent of the population of Jamaica identifies as Latino, 14 percent Asian, and 59 percent Black. A significant number of residents are recent immigrants with limited English language skills. Furthermore, according to the New York City Department of Education, fully 90 percent of the district's schoolchildren are eligible for free or reduced-cost lunches.

King Manor is the only historical resource serving this underserved, but rapidly developing, community. Every program at King Manor is designed to encourage critical thinking in learners of all skills

and experiences, creating spaces for our visitors to mindfully engage with history in order to promote a healthier democracy as a whole.

For several years, we have incorporated aspects of environmental history in our school field trips and public tours, but the pandemic shone an even brighter spotlight on the importance of green spaces to our community, prompting us to launch a wider set of public initiatives focused on environmental education, sustainability, and climate change.

Making Space for Environmental Education

King Manor was the first cultural institution in New York City to sign on to "We Are Still In" and is the first public food-scrap drop-off in Southeast Queens. And we have been bringing environmental education into our humanities practice for years by including it in the narrative of our public tours and especially through our ethnobotanic garden and seed library.

A large body of research demonstrates that gardens have the ability to improve mood, develop social and emotional skills, and promote health and wellness. Our mission is to "teach critical thinking for a healthier democracy," and we operate with the understanding that a "healthy democracy" must include a healthy populace and a healthy planet.

We have partnered with Reclaim Seed, a grassroots organization reconnecting people to their foodways—the cultural, social, and economic practices relating to the production and consumption of food—through history, education, and plants. In June 2019, we installed a teaching garden that focused on ethnobotany: activating the historical roots of a previously underutilized position of our lawn by interpreting the agricultural history of the King family. The garden, which Reclaim Seed stewarded in its first growing

“Our mission is to ‘teach critical thinking for a healthier democracy,’ and we operate with the understanding that a ‘healthy democracy’ must include a healthy populace and a healthy planet.”



ADDING SPACE FOR LOCAL ART

A community-wide survey in 2017 identified the need for more places for local artists to display their work within their own community. So during a pandemic-induced mandatory closure of King Manor in 2020, we turned an underutilized storage area into a beautiful gallery space. Since opening the space, we have hosted several contemporary art exhibitions (almost all community curated). Most of the artists' work has explored social justice themes, and the majority have had an environmental justice focus.

For example, Hayoon Jay Lee's *Beyond Life and Death* invited viewers to consider their individual relationships with food along with the connections between foodways and the environment. She used objects from the museum's collection, bones (both modern and archaeologically recovered examples from the museum's grounds), and encapsulated grains of rice to create a multilayered tablescape installation accompanied by a video of the artist and a diverse group of women at the table talking about food and globalization.

Sari Nordman's *Tower* (above, right) projected multilingual interviews about climate change on a tower constructed of metal and reclaimed plastic sheets. Meant to evoke the Tower of Babel, Nordman writes that her piece told a "story of greed and the value of cultural differences. ... The interviews are recorded in the interviewee's native language to emphasize the global impact and responsibility in fighting climate change." The message of this piece, installed on the museum's lawn, fit perfectly with the multicultural setting of Queens and King Manor's mission and vision.



Detail of an indigo-dyed woven coverlet currently on display in the John Quincy Adams bedroom on the museum's second floor.

season, also served as a living archive, exploring the ancestral foodways of the Indigenous Lenape, enslaved and freed Africans, and early European settlers of New York City.

Younger students were particularly excited to see the Three Sisters planting technique—in which three plants grow symbiotically to deter weeds and pests, enrich the soil, and support each other—in action after learning about this in school. Although the park's squirrels had their own plans for most of the produce we grew, we were able to successfully harvest seeds for our free seed library and used the next growing season (during the height of the pandemic) to grow crops for seed, promote local biodiversity, and encourage visitors to see themselves as potential stewards of land.

In response to pandemic-era limitations on school field trip opportunities, King Manor has partnered with the Growing Up Green Charter School in Jamaica to develop an ongoing STEAM (science, technology,

RESOURCES

Jennifer Anderson, *Mahogany: The Costs of Luxury in Early America*, 2012

David Blackbourn, *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany*, 2007

Andrea Feeser, *Red, White, and Black Make Blue: Indigo in the Fabric of Colonial South Carolina Life*, 2013

Kieko Matteson, *Forests in Revolutionary France: Conservation, Community, and Conflict, 1669–1848*, 2015

Erin Stewart Mauldin, *Unredeemed Land: An Environmental History of Civil War and Emancipation in the Cotton South*, 2018

Photo by Christina Carlin, King Manor Museum

engineering, arts, and mathematics) garden program for students in grades K–5. In the teaching garden's third growing season, these students have taken ownership of the garden beds, regularly coming to King Manor to work in the garden and explore the science of pollination, the foodways of different historic and modern cultural groups, and the civics of food production. Compost Project NYC and the Queens Botanical Garden are sharing their expertise, including assisting with compost training for teachers.

Working with the garden also taught us, the museum staff, a lot about land stewardship. Since building the raised beds, we are all much more attuned to the effects of climate change on our little plot, noticing when extreme weather affects the growing season, such as a late snowstorm in the spring of 2021 that stunted the growth of plants that had already sprouted. This made us more aware of similar impacts of climate change throughout the park where our museum is located, such as buds that never get to bloom because of unexpected cold snaps or leaves that fail to change colors until December because of warm fall temperatures.

This has made us think about further-reaching impacts of climate change on the natural environment and agricultural production, like apple orchards losing fruit or the decreasing environment suitable for the growth of sugar maple trees, as global temperatures rise. Although we had all been aware of such phenomena, experiencing it firsthand through a closer relationship with our natural environment has been eye-opening.

We hope that by increasing community members' ownership of the garden, they will also start making these connections between their immediate environment and global climate change. This connection between the familiar, or microcosm, and the macrocosm is the foundation of our approach to fostering critical thinking. It is how we structure everything from school tours to art installations and exhibits.

Leveraging Technology

Our global responsibility to combat climate change doesn't end when we go inside, and we felt that our period rooms offered a unique entry point for thinking about environmental history in a domestic space.


To that end, we recently launched "Climate Change at Home," a technology-enhanced tour of the museum that helps visitors understand the history of climate change and addresses climate anxiety by bringing this global phenomenon to a household level.

This technology-assisted experience allows visitors to examine the materials, manufacture, and global environmental impact of the 19th-century objects in King Manor's period rooms. As visitors scan the room with their smartphone or borrowed iPad, their device will pick up input from radio-frequency identification (RFID) tags that are hidden inside or behind objects that curatorial and educational staff have selected for the tour. Since RFID tags can be read at a distance, this technology has allowed us to add extra layers of meaning to period room displays without disrupting their historic setting.

For example, visitors can see how mahogany furniture led to the deforestation of many Caribbean islands, how the spice trade meant both an expanded palette and carbon footprint, and how an indigo-dyed blanket is a reminder of early monoculture practices in the US that continue today to the detriment of soil health and biodiversity. By the end of the tour, visitors can "read" the climate history of objects in the museum on their own—and start thinking about how their everyday choices are part of a larger global phenomenon, helping them understand climate change on a more personal level.

Our goal is to empower visitors to understand and recognize how human actions have impacted the environment over time and today. We hope that visitors will not only recognize the larger environmental histories of the household objects in the museum, but will also continue to use this critical approach to understanding the world around them long after their museum visit is over.

History is not teleological but a result of individual and collective decisions. At King Manor, we hope to help visitors understand the historical roots of current issues so that they can make effective change.

 **Kelsey Brow** is executive director of King Manor Museum in Jamaica, Queens, in New York City.

BRINGING

The Burke Museum is the Washington state museum of nature and culture and is located on the University of Washington campus in Seattle.



RESOURCE



OUR

Academic museum professionals can use their institution's resources to help the wider community better understand the climate crisis.

ESTO

BEAR

In her keynote address

to the UK's Museum Association in 2019, climate activist and attorney Farhana Yamin began by posing a provocative question: "How many of you have declared a climate and ecological emergency?"

As the trusted public-facing interpretive bridge between research and innovation on university campuses and the public at large, academic museum professionals are practiced experts at dialogic display and interpretation across and among our cultural heritage, exhibitions, and public programs and scholars, scientists, artists, public intellectuals, students, and wider communities.

Often, academic museums are the first cultural organizations to begin publicly introducing the difficult stories, crucial truth-telling, and alarming data that originates out of new scholarship. Academic museums are therefore in a unique position relative to the climate crisis and its solutions.

Photo by Pavel Verbovski

By Natalie Marsh and Kristina Durocher

Sustainability Leadership in Higher Education

Because they are nested administratively within universities and colleges of all types and sizes, academic museums often find themselves in the uniquely complex intersection of policies and practices dictated by the parent institution's leadership and operations. In other words, most academic museums look to their parent institution to make many emission-lowering sustainability changes and policies.

Universities and colleges have created coalitions and associations to coordinate sector-wide accountability for addressing climate action. Now in its 29th year, Second Nature has secured commitments from over 450 universities and colleges to reach net zero emissions. Each institution actively reports their progress using a carbon and nitrogen accounting tool called SIMAP that was created by the University of New Hampshire's Sustainability Institute.

"Presidential commitments used to be the primary way that climate action got started," says Second Nature President Timothy Carter. "Today, because climate action is taken for granted on many campuses, the senior leader's role is evolving, and many

campuses are expanding beyond operational action into a 'whole of higher education' understanding about the climate emergency. This is an important maturation of higher education's role in responding to the crisis."

While Second Nature currently focuses on university leadership and institutional commitments, the Association for the Advancement of Sustainability in Higher Education (AASHE) works on strengthening and growing curricula; helping faculty, administrators, and students create effective campus and community programs; and transitioning operations. AASHE also manages the Sustainability Tracking, Assessment and Rating System (STARS), a self-reporting framework for colleges and universities to transparently document and measure their sustainability performance across 18 categories, including academic and public engagement, well-being, and diversity.

Academic Museum Climate Actions

Academic museums are uniquely positioned within the museum sector to lead community education about sustainability and environmental justice because of their access to current research and expertise



Guests from the Great River by Chinook artist Tony A. (Naschio) Johnson and Adam Mclsaac greets visitors to the Burke Museum.

Photo by Rachel Ormiston/Burke Museum

across a range of university disciplines. At many institutions, researchers have deep knowledge of local and regional history, culture, and ecosystems. As universities and colleges start to re-evaluate their origins on expropriated Indigenous land, ecological expertise has expanded to include Indigenous inhabitants and caretakers, further informing institutional sustainability practices and environmental scholarship.

For example, the Burke Museum of Natural History and Culture at the University of Washington was recently cited for its leadership in new construction by AAM's Environment and Climate Network Sustainability Excellence Awards. The museum's strong reciprocal relationship and exchange with Indigenous peoples is reflected through knowledge sharing and equitable practices that often intersect with climate and environmental justice issues. A recent building project reduced the total footprint of the facility, and the redesign made the formerly closed collections and research lab spaces more open and accessible to the public. Energy-efficient lighting, low-flow water fixtures, a new air quality and mechanical system, and use of local, recycled, and durable materials were combined with natural stormwater filtration and ethnobotanical plantings for a more resilient campus.

During the pandemic, the Bell Museum at the University of Minnesota undertook sustainability efforts that garnered an honorable mention from AAM's Sustainability Excellence Awards in the category of facilities and site operation. The museum made adjustments to its air circulation and energy consumption monitoring, remediated the impact of increased outdoor visitor traffic, and made easy, climate-friendly changes to cleaning protocols. With more visitors eating meals outside and spending time on the museum's grounds, the staff had to tackle a growing wasp problem connected to visitor waste. Wasps not only sting visitors, but harm bee colonies. The museum called researchers at the university's Bee Lab and coordinated with the university's vendor to develop a new sustainability-focused response. Inside the facility, supply shortages created a scarcity of materials that led to new, sustainable operational cleaning solutions: reusable and cost-effective kitchen gloves replaced disposable latex gloves and compostable absorbent wipes replaced paper towels.



A rendering of the energy-efficient and sustainably constructed John and Lile Gibbons Center for Arctic Studies at Bowdoin College.

RESOURCES

STICH

This calculator compares the carbon footprint of museum materials to aid in selecting those with a lower impact.

stich.culturalheritage.org

ViVA Virtual Visiting Artists

Nonprofit that connects intersectional climate change and environmental justice artists to academic museum audiences, classrooms, and fellow cultural organizations.

vivavirtualartists.org

Galleries Commit & Artists Commit

Sister organizations in the US collaborated to form these initiatives to help measure, track, and shift gallery and exhibition practices.

galleriescommit.com; artistscommit.com

Julie's Bicycle

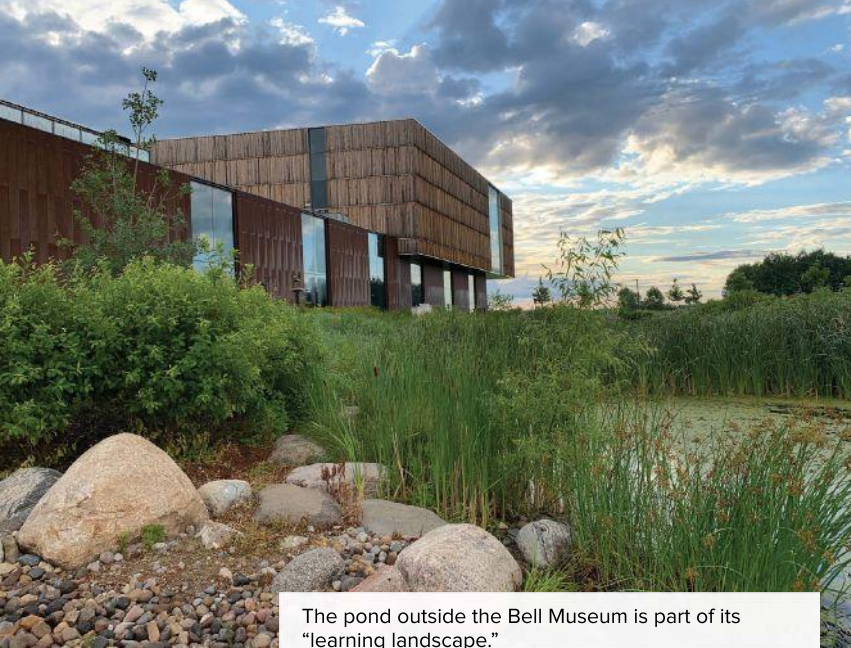
A multifaceted UK-based organization addressing climate crises across multiple programs, disciplines, and tools.

juliesbicycle.com

Ki Culture

Based in the Netherlands, this nonprofit works to connect resources and expertise to the cultural sector and is noted for its publications.

kiculture.org



The pond outside the Bell Museum is part of its “learning landscape.”

The University of New Hampshire, located on the Great Bay, one of the largest estuaries on the Atlantic Coast, maintains an elite platinum STARS ranking. UNH is a leader in marine biology and ocean research, and the university’s Museum of Art has worked closely with the on-campus Sustainability Institute on a variety of art initiatives, including public art, video competitions, and art exhibitions, to make climate research visible to the campus and wider community. One such project, “Long Eye,” featured work by Anna McKee, an artist who visited the West Antarctic Ice Sheet Divide ice core field camp where the university managed the Science Coordination Office. Her installation artistically interpreted the past 68,000 years of Antarctic temperature fluctuations and geologic time, visually expressing the dramatic acceleration of current climate change.

Alongside university sustainability offices, which are often focused on helping the institution measure, track, and report their campus-wide transition to green energies and new policies and practices, interdisciplinary centers and institutes are coordinating research, programs, and communication. UCLA’s Laboratory for Environmental Narrative Strategies (LENS), Princeton’s High Meadows Environmental Institute, and Arizona State University’s Global Institute of Sustainability are just a few examples. Many centers and institutes include collections, host exhibitions, and run public programs.

Located in Brunswick, Maine, Bowdoin College’s John and Lile Gibbons Center for Arctic Studies and neighboring Mills Hall complex bring together labs, classrooms, auditorium spaces, and the Peary-MacMillan Arctic Museum. The new energy-efficient buildings are scheduled to open in late 2022 and are designed using a mass timber structural system (instead of steel) that reduces the carbon footprint by 75 percent and eliminates the use of fossil fuels in building operations. More than 80 native trees will replace those removed for the construction.

In addition to organizing recent artist talks for interdisciplinary courses taught by Princeton’s High Meadows Environmental Institute faculty, new national nonprofit ViVA (Virtual Visiting Artists), partnered with Saint Vincent College’s Verostko Center for the Arts and Foster and Muriel McCarl Coverlet Gallery

TIPS FOR GETTING STARTED

- In addition to the institution’s sustainability office, work with university environmental offices (often located within facility and maintenance units) to undertake energy audits to identify and remediate heating and cooling losses in museum buildings. Consider ways this work could involve environmental or sustainability studies faculty and students.
- Work with campus planning offices to evaluate and rethink exterior spaces, including their suitability for outdoor seating, adaptive landscaping to mitigate heavier rainfall, or options for increased shade.
- Collaborate with on-campus experts to write a climate plan—a strategic plan for how the museum will measure and reduce greenhouse gas emissions.
- Revise your disaster preparedness and emergency response policy to better fit the projected reality for your geographic locale in the face of climate change.
- Prioritize regular and ongoing curatorial, public education, and informal programming centered on the intersectionality of climate change and environmental justice. Find creative ways to use your collections to educate your campus and community about these issues.
- Offer your campus museum as a beta site for piloting front-facing testing of practices and messaging around new sustainability policies and programs.

to craft a series of four virtual artist talks on climate change and environmental justice. By hosting virtual visiting artist talks instead of on-campus, in-person visits, Saint Vincent reduced travel-related CO₂ emissions by 2.1 metric tons. That equates to traveling around the world 8.7 times by electric train or being vegetarian for 3.9 years.

With National Endowment for the Humanities (NEH) support, several academic museums around the country have begun to undertake assessments and adjustments to collections care and facilities in light of extreme environmental threats. The Museum of the Coastal Bend at Victoria College, a public community college in coastal Texas, is located in an area affected by Hurricane Harvey in 2017. Collections traversing 13,000 years of Texas history were exposed to damaging high heat and humidity due to hurricane-related power loss. The museum is now seeking to address preventative conservation measures and disaster response capabilities with the NEH funding.

A Call to Action

Academic museums, with their outward-facing positions on campus, frequently act as sites for community conversations and dialogue. They are places where adaptation, resiliency planning, and environmental policies can be discussed in trusted, creative, and collaborative spaces. Museums can and should be seen as reliable partners in keeping people engaged in sustainability efforts that also focus on health, democratic practices, and the healthy ecology of communities through cultural participation.

For this to occur, however, higher education administrators, sustainability professionals, and faculty need to recognize museums as a unique asset—in a divided time we are one of the few trusted interdisciplinary hubs for both internally focused and public-facing efforts tied to climate change and environmental justice education, the translation and showcasing of research and expertise happening on campuses, and empathic storytelling that will activate greater action throughout wider communities and regions.

Also, the larger museum community can learn a great deal from higher education. The museum sector and its leadership should look to higher education's coordinated undertakings to formulate comparable measurement and tracking tools, seek signatory commitments from member institutions, and encourage the community to find solutions and take action to reduce greenhouse gas emissions. To both sectors, we suggest that the accreditation processes reflect greater insistence on sustainability measures.

Natalie Marsh, Ph.D., is co-founder, executive director, and chief curator of the new climate conscious nonprofit Virtual Visiting Artists (ViVA), and the secretary of the Association of Academic Museums & Galleries (AAMG). **Kristina Durocher** is the president of AAMG and director and chief curator of the Museum of Art at the University of New Hampshire.



View of the “Long Eye” exhibition at the Museum of Art at the University of New Hampshire.





PROTECTING EARTH'S HEART

Monterey Bay Aquarium is doing its part to cut emissions and waste to keep the effects of climate change from further affecting ocean health.

By Claudia Pineda Tibbs

The Monterey Bay Aquarium's kelp forest exhibit.



As land creatures, we may not be wired to think much about the ocean—how its cycles are directly linked to our own survival, and how our choices affect it.

Selfishly, we should. We depend on the ocean in so many ways. Its marine life provides one-sixth of the animal protein we eat. Its waters carry more than 90 percent of the world's trade—moving goods and raw materials more cost-effectively than any other mode of transport. Its shores are home to nearly half of all people on Earth.

The ocean is the heart of Earth's climate system; its currents and winds circulate heat and moisture around our planet. The weather patterns we associate with different regions of the world have been relatively stable throughout human history, thanks to the ocean.

And the ocean buffers us from the most severe impacts of climate change, absorbing about 30 percent of the carbon dioxide—and over 90 percent of the excess heat—we've produced by burning fossil fuels.

Now, climate change is disrupting fundamental ocean processes that sustain life on Earth. Sea levels are rising, placing tens of millions of coastal residents in harm's way. Intensifying storms are costing human lives and causing billions of dollars in property damage. It's time to recognize that human health is directly tied to ocean health.

Given the significance of the ocean—including its role in moderating the impacts of climate change—the Monterey Bay Aquarium, located on California's central coast, is working on many fronts to keep it healthy and productive.

A Closer Look at the Problem

Climate change is the greatest environmental challenge of our time. Carbon emissions from human activities pose a triple threat to ocean health: warming its waters, changing its chemistry, and depleting its oxygen. This is affecting not just ocean wildlife but also our own survival—in profound ways.

A study published last year by Monterey Bay Aquarium documents the inherent disparities and greatest impacts of climate change across the globe. Heat-trapping emissions originate primarily in developed and industrialized regions in Western Europe, northeastern North America, and the Arabian Gulf,

yet the majority of climate impacts and changes in surface temperatures will occur across Africa and Central Asia.

This complex relationship between emissions and impacts is also occurring at the country level, and the United States offers a startling example. Most greenhouse emissions in the US originate in the more industrialized northeast corridor, but most of the impacts of those emissions show up in the West—where land temperatures are increasing most notably in Alaska, South Dakota, Idaho, and Montana.

Scientists at Monterey Bay Aquarium found that just 8 percent of Earth's surface area generates 90 percent of all human-caused greenhouse emissions—yet more than half of Earth's landmass will experience extreme warming by the end of the 21st century. The climate disparities study also illustrates the critical role of the ocean in absorbing excess heat and buffering the severity of climate impacts.

The ocean supports all life on Earth, and represents 99 percent of the habitable space where life can exist. Over time, it has generated more than half the oxygen we breathe. It provides us with food, supports jobs, and drives global commerce, and it has buffered us from the worst impacts of climate change.

What the Aquarium Is Doing

One of the aquarium's top priorities is to address climate change and its impacts on ocean health. As one of the first cultural institutions to sign the "We Are Still In" declaration—a pledge in support of the global climate pact known as the Paris Agreement—it has committed to achieving net-zero carbon emissions in its own operations by 2025.

The aquarium is reducing carbon dioxide emissions as much as possible through energy efficiency improvements throughout the campus's footprint, encouraging staff and volunteers to decarbonize their commute and installing solar panels on all aquarium property. Then, to balance out the carbon emissions it can't avoid, the aquarium is purchasing offsets that enable the removal of an equivalent amount of carbon from the atmosphere.

Since 2017, the aquarium has been working with Natural Capital Partners to achieve CarbonNeutral certification, the global standard. The certification



Western sandpipers (*Calidris mauri*) at Asilomar State Beach in California.

involves an independent assessment of our carbon emissions from direct and indirect sources. Then, the aquarium purchases offsets to support low-carbon sustainable development and renewable energy projects around the world, such as the Rimba Raya Biodiversity Reserve in Indonesia and Acre Amazonian Rainforest Conservation in Brazil. These projects are independently verified to assure the quality of the emissions reductions.

Monterey Bay Aquarium is also one of the only event programs that offset the associated emissions

RESOURCES

Natural Capital Partners
[Naturalcapitalpartners.com](https://www.naturalcapitalpartners.com)

Kyle S. Van Houtan, Kisei R. Tanaka, Tyler O. Gagné and, Sarah L. Becker, “The geographic disparity of historical greenhouse emissions and projected climate change,” *Science Advances*, July 14, 2021
science.org/doi/10.1126/sciadv.abe4342

Monterey Bay Aquarium, “Achieving Net Zero Carbon Emissions”
montereybayaquarium.org/stories/bringing-our-net-carbon-emissions-down-to-zero

MANGROVES: A KEY DEFENSE SYSTEM

Mangrove forests are key to protecting coastal communities from crashing waves, storms, and flooding. This natural defense system is more important as storm intensity and frequency increase due to climate change. Unfortunately, in many places mangroves have been cleared to make room for development, agriculture, or aquaculture, which leads to more erosion and less protection from storms.

The dense root structure of mangroves also helps trap muddy soil, slowing coastal erosion and preventing runoff from deteriorating the water quality of nearshore habitats like coral reefs. Mangroves also absorb carbon dioxide from the atmosphere and use it to build their leaves, stems, and roots. Once the leaves or tree die and fall to the seafloor, the carbon is sequestered in the soil. The low-oxygen, waterlogged soil slows decomposition of the plant matter—instead, the carbon is trapped in the soil for millennia.

Mangroves, along with seagrasses and salt marshes, are called blue carbon ecosystems due to their ability to sequester large amounts of carbon from the atmosphere. In fact, blue carbon systems are estimated to sequester carbon at a faster rate than land forests, even though they cover less area on the globe. Preserving these blue carbon ecosystems, and restoring habitats that have been lost, is critical to slowing the impacts of climate change.

Today, mangroves are disappearing at about 1 to 2 percent per year. Over the previous 50 years, it is estimated that 35 percent of mangroves have disappeared. One out of every six species of mangroves is considered endangered, threatened, or vulnerable, according to a 2010 International Union for Conservation of Nature assessment.

Much of this loss is due to human behavior—deforestation for development, unsustainable aquaculture, agriculture, and timber harvesting. As sea level rises, mangroves are no longer able to retreat inland because they run up against human-developed structures.

The loss of mangrove habitats has big consequences. Coastal areas are at risk, important animal habitats disappear, the lives and livelihoods of millions of people around the world are threatened, and carbon dioxide is released into the atmosphere.



Red mangrove (*Rhizophora mangle*) growing in the Caribbean.

Monterey Bay Aquarium, photo by Charles Seaborn

from events held on-site. For its corporate events program, it's gone a step beyond. All events it hosts are CarbonNeutral certified, meaning emissions attributed to events (including travel to and from Monterey and from attendees' lodging in the area) are offset by planting teak trees.

And the aquarium is building future sustainability through its partnership with Natural Capital's Million Mangroves, which plants vital coastal trees in southern Mexico, restoring critical habitat for fish and other species. Mangroves can store four times more carbon than a rainforest, making them one of the highest-impact climate and blue carbon (the carbon stored in coastal and marine ecosystems) solutions available. (See "Mangroves: A Key Defense System" sidebar on previous page for more information on the vital importance of mangroves.)

As part of the aquarium's ongoing efforts to expand sustainable business practices and continuously reduce the net greenhouse gas emissions arising from business operations, it is using data to track progress and inform future strategies to reduce emissions. Monterey Bay Aquarium implements a range of energy efficiency measures in exhibit spaces that include using natural lighting to make the visitor experience feel more immersive, using LED lighting that doesn't take away from the experience of escapism into an underwater environment, and employing an effective heat exchange and recovery program that uses the heat in stale exhaust air to preheat incoming fresh water for certain fish species on exhibit.

The aquarium is also committed to achieving net-zero waste by making the best choices related to natural resources—from extraction to production to consumption and disposal of materials. Just before closing its doors to the public in March 2020, the aquarium conducted its first waste audit, an analysis of the amount and type of waste generated across the entire campus. The audit found that 40 percent of the waste generated at the aquarium is destined for the landfill. The aquarium is continuing to reduce this percentage by composting, recycling, and preventing the waste in the first place. At the time of the waste audit, the aquarium was diverting more than half of its waste, in large part by composting

food from the cafe, on-site catering, and animal care operations, therefore, preventing methane (a greenhouse gas far more potent than carbon dioxide) from building up in landfills.

In addition, the aquarium is continuing to phase out petroleum-derived products like plastic, which are increasingly difficult to recycle in the United States. This is important since it's estimated that over 90 percent of albatross chicks have plastics in their bellies.


The aquarium also sources environmentally responsible, as well as local, seafood and land-grown produce to serve in the cafe and for the aquarium's living collections. Buying locally produced seafood and produce allows the aquarium to shrink its carbon footprint and build connections with the people who produce the food prepared at the aquarium. It also creates transparency along the food supply chain, supports fishing and farmer families, strengthens local economies, and helps build healthy regional food systems.


We Must Act Now

There are still other signs of how the ocean is being negatively affected. Warming water is choking tropical corals and stunting kelp forest growth along the California coast. Carbon pollution is making seawater more acidic, dissolving the shells of plankton that are the foundation of ocean food webs.

To solve the climate crisis, humanity must address the health of the ocean—the largest ecosystem on our planet. The ocean is our first line of defense against the impacts of climate change, absorbing a significant share of the excess carbon dioxide and heat we produce by burning fossil fuels. And a healthy ocean helps protect humanity from the intensifying impacts of climate change.

Moving forward, the ocean must be front and center in the climate conversation. When we protect Earth's living heart, home to the greatest diversity of life on our planet, we safeguard ourselves.

 **Claudia Pineda Tibbs** is sustainability program manager at the Monterey Bay Aquarium in California.



The installation at COP26 of *Machine Hallucination. A Data Visualization of Physical Climate Risk*, by Refik Adadol Studio, uses the Trucost Physical Risk Dataset to create a visceral feel for the many ways that climate change manifests as a threat.

LET'S GO ALL IN

The international climate conference makes clear that we all must do our part to slow the climate crisis.

By Patrick Hamilton

Last summer, when my wife and I started making arrangements to attend the UN Climate Change Conference (COP26) in Glasgow that November (her sixth and my fifth), the United Nations estimated that between 20,000 and 25,000 would attend. But even with a global pandemic still in full swing, an unprecedented 39,509 people eventually registered for the conference—a sign of a rapidly rising apprehension about the escalating global climate crisis.

At several COP26 sessions, I spoke about the large potential for US cultural institutions to showcase climate action and to inspire Americans to meet the climate challenge. I repeatedly pointed out that cultural institutions are held in very high regard by Americans, polling well above academic institutions, the media, and all levels of government in their levels of public trust; that cultural institutions are very popular, attracting hundreds of millions of visits annually; and that Americans want their cultural institutions to provide inspiration and leadership on issues important to their lives, such as climate change.

Now we must all act on these truths to help address this worsening crisis.

What Happens at COP?

The first Conference of the Parties (COP) took place in 1995, and the one in Glasgow was the 26th meeting of the 197 nations that are parties to the United Nations Framework Convention on Climate Change (UNFCCC) treaty, which seeks to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This treaty was the outcome of the United Nations Conference on Environment and Development that took place in June 1992 in Rio de Janeiro. By spring 1994, enough nations had ratified the treaty that it became international law. The annual COP seeks to meet the treaty's goals by setting ever higher climate commitments for all 197 nations that are signatories to the UNFCCC.

Several important processes occur simultaneously at COP meetings. Foremost are the formal negotiations, intensively covered by international media, which endeavor to craft a document that all 197 COP delegations can pass by unanimous consent. Complementing the COP negotiations are side

agreement discussions and the exhibition pavilion.

The outcome of the formal negotiations at COP26 was the Glasgow Climate Pact, which achieved several milestones but two in particular. The breakthrough at the COP21 meeting in 2015 was the adoption by unanimous consent of the Paris Agreement, which permitted each nation to establish its own nationally determined contributions (NDCs) about where, when, and by how much it would reduce greenhouse gas emissions. The Paris Agreement noted that implementation guidelines would eventually need to be established. The Glasgow Climate Pact finalized the Paris Rulebook—detailed guidance for countries as they each consider how to strengthen their NDCs in light of their different national circumstances.

The Paris Agreement acknowledged an aspirational goal of limiting global average temperatures from rising no more than 1.5°C (2.7°F) above pre-industrial levels but maintained 2.0°C (3.6°F) as the official international target to avoid dangerous changes to the climate system. The Glasgow Climate Pact officially establishes 1.5°C as the new international target, given that climate disasters are occurring with increasing frequency and intensity in a world that has warmed just 1.1°C (2.0°F) from pre-industrial levels.

Although they do not reach the scale of unanimous consent, side agreements reached at COP26 among subsets of nations were nonetheless vitally important because they signified the willingness of signatories to accelerate their climate commitments beyond what is spelled out in the Glasgow Climate Pact. For instance, by the end of COP26 more than 100 nations, encompassing 86 percent of the world's forested lands, had signed an agreement to reduce deforestation now and eliminate it entirely by 2030. And by the conclusion of COP26, more than 100 nations had signed on to a pledge to reduce emissions of methane, which has 80 times the global warming potential of carbon dioxide, by 30 percent by 2030.

My Experience

So what was my path among the 40,000 people within the COP and the tens of thousands outside? As with previous COPs, I sought out in-person access to some of the latest science and bold initiatives envisioned to address climate change.

At the Environmental Defense Fund's (EDF) Methane Moment Pavilion, for instance, I was fascinated and encouraged to learn that this October EDF will launch into space a satellite that once it becomes fully operational will provide anyone with free, high-resolution, nearly real-time imagery of methane gas emissions virtually anywhere on the planet. In the near future, all of us will be able to access imagery of our geographic areas of interest and ask why this colorless, odorless, tasteless but very potent greenhouse gas is being allowed to escape into the atmosphere.

And at the "Culture Over Carbon: The US Cultural Sector Advancing Climate Action" session organized by Sarah Sutton, CEO of Environment & Culture Partners, Jen Kretzer from The Wild Center, Richard Piacentini from The Phipps Conservatory, and I made the case for how our institutions are using our facilities, programs, and exhibits to showcase climate action and to encourage more cultural institutions to champion urgent action to address the climate crisis.

What We Can Do

Every day of COP26 I waded through an astonishing river of dire climate change scientific updates and announcements of exciting, bold climate initiatives while looking for opportunities to make the case for how cultural institutions can accelerate an all-of-society approach to the crisis. Thinking back on all that I saw and heard in my two weeks there, three big take-aways have distilled in my mind.

Progress is being made. The Glasgow Climate Pact was a significant international achievement. Does it go far enough? No, climate change presently is outpacing international actions to mitigate greenhouse gas emissions and to increase resilience to climate change by all nations, and especially those most at risk and least responsible for causing the crisis. There is a rapidly growing international consensus, however,

that subsequent COPs will accelerate climate commitments because of the realization that no nation is immune from the impacts of climate change.

Subnationals must step up. By "subnationals" I mean any individual or entity not a member of a national negotiating party, so that includes businesses, investors, health care organizations, Indigenous nations, cities, counties, states, faith groups, colleges and universities, and cultural institutions. At the COP26 meeting, the US negotiating team members, led by Special Envoy for Climate John Kerry, were constantly pressing their counterparts to agree to more ambitious climate goals while looking over their metaphorical shoulders to see if they have the support and commitment back home to do so. The more we do as cultural institutions to implement, highlight, showcase, and champion climate action, the more latitude we provide the US negotiating teams to advocate vigorous international climate action at future COP conferences.

The 2020s will be decisive. Highly sophisticated models have long pointed to the likelihood that increasing global temperatures would ramp up the frequency of extreme weather events in the 2030s and 2040s. The fact that they are happening now suggests a climate system more sensitive to carbon dioxide pollution than scientists previously thought. Therefore, carbon reduction strategies are more urgently needed now. Cultural institutions should prepare their audiences for the work ahead by encouraging them both to accelerate greenhouse gas reductions to help lessen future climate changes while concurrently hastening their resilience to the changes underway and to come.

We need an all-in strategy with cultural institutions. Let's employ our high visibility and public trust to greatly accelerate climate action and justice. Imagine the enormous environmental, economic, employment, equity, and educational potential we could have, and let's turn imagination into reality. I look forward to working with you to do so.

RESOURCES

Science Museum of Minnesota statement on climate change

new.smm.org/climate-change

Frankenthaler Climate Initiative

frankenthalerclimateinitiative.org/

Patrick Hamilton is director of climate change, energy & the environment at the Science Museum of Minnesota.

Patrick Hamilton

THE PATH TO CARBON NEUTRALITY

Buildings consume 40 percent of all energy used in the US and are responsible for a comparable share of the nation's greenhouse gas emissions. While I applaud the design and construction of new buildings that showcase energy innovation, we are not going to build our way out of this dilemma. Existing buildings, including those occupied by cultural institutions, will need to be retrofitted. Here is what the Science Museum of Minnesota has done.

In 2008, I met with a mechanical engineer who described how it is standard operating procedure for large commercial and institutional buildings in the US to operate heating and cooling systems simultaneously, which is very expensive. Two years later, the museum had raised the necessary funds to hire this engineer to conduct a comprehensive energy analysis of our museum.

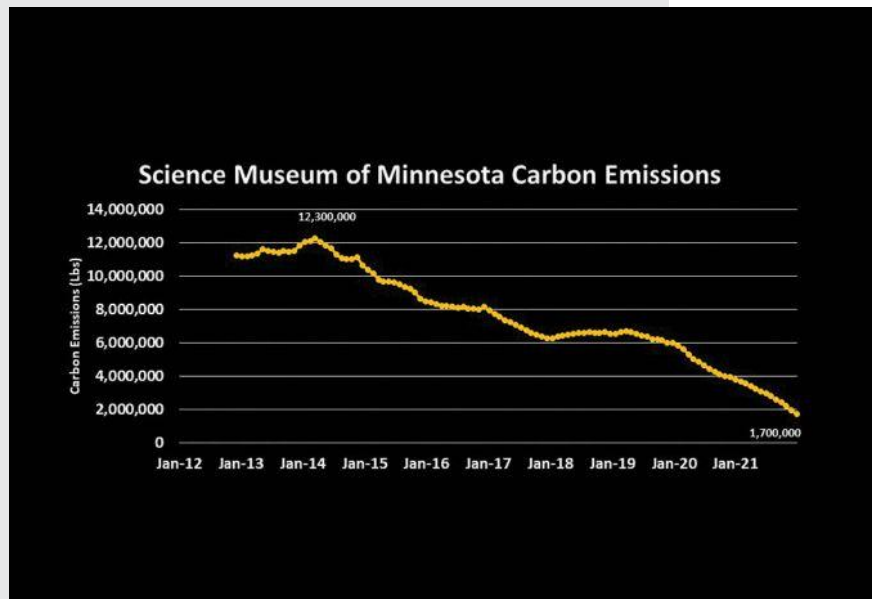
The engineer reported that the museum was using 6.5 million kWh of electricity annually. As a geographer by training, I translated that number into terms I could appreciate: the museum was using as much electricity as all of the households in a 20-block area of Saint Paul, Minnesota. The engineer also pointed out that all of this electricity eventually degraded into over 20 billion BTUs of heat energy annually. We were expelling this heat from the building and then turning around and purchasing enormous quantities of heat. Why? Because no one had previously informed us of this ridiculous situation.

Using a low-interest loan and corporate gifts, we purchased and installed two machines—heat recovery chillers—that enable the museum to extract heat from sites in the museum where electricity usage, and thus heat production, is large (e.g., elevator equipment and computer server rooms) and then transfer this heat energy to where it is needed, such as warming the fresh but cold air brought into the building in winter.

This project cost the museum \$900,000, but by the first full year of operation in 2015, the museum had cut its carbon pollution by 30 percent and was saving \$300,000 annually—money that now can be directed to the museum's scientific and educational mission rather than utility bills.

Calculations finalized in January revealed that the Science Museum's annual carbon emissions had decreased 86 percent from their peak in early 2014. In February, the museum's senior leadership team declared that the museum will be 100 percent carbon neutral by 2030.

Please contact me (phamilton@smm.org) to learn how the Science Museum of Minnesota calculates and monitors the carbon emissions attributable to the heating, cooling, and powering of its buildings and how your institution could do so as well. You can't manage what you don't measure.



REFLECTION

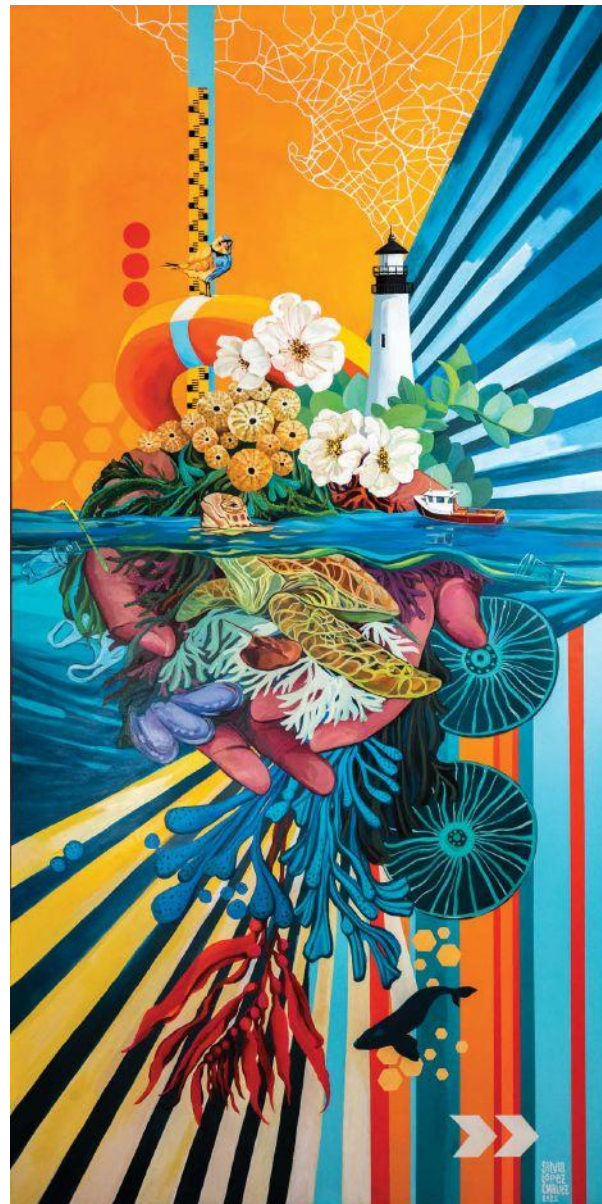
I don't love you as if you were rare earth metals,
conflict diamonds, or reserves of crude oil that cause
war. I love you as one loves the most vulnerable
species: urgently, between the habitat and its loss.

I love you as one loves the last seed saved
within a vault, gestating the heritage of our roots,
and thanks to your body, the taste that ripens
from its fruit still lives sweetly on my tongue.

I love you without knowing how or when this world
will end. I love you organically, without pesticides.
I love you like this because we'll only survive

in the nitrogen rich compost of our embrace,
so close that your emissions of carbon are mine,
so close that your sea rises with my heat.

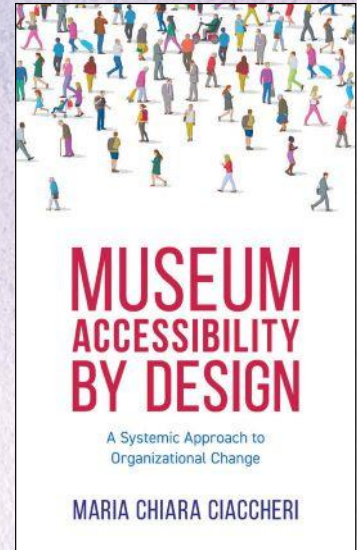
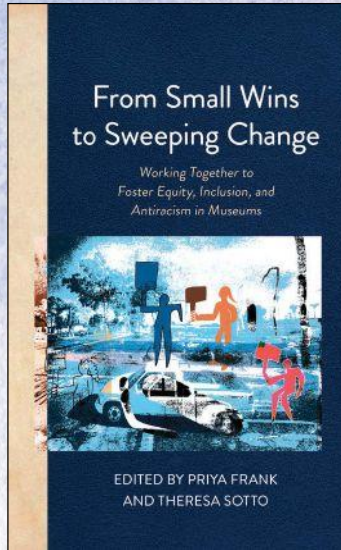
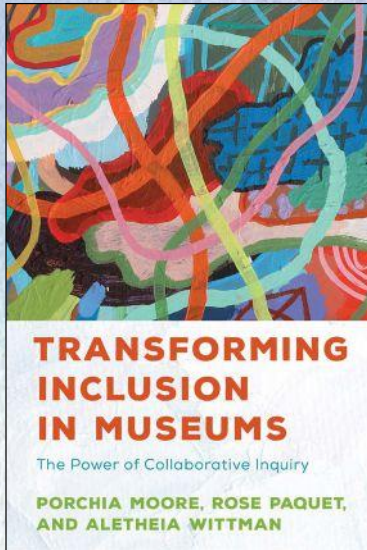
Craig Santos Perez, "Love in a Time of Climate Change" from *Habitat Threshold* © Craig Santos Perez, 2020. Reprinted with permission of Omnidawn Publishing.



Silvia Lopez Chavez, *Undercurrent*, 2022
Mixed media commissioned by the Peabody Essex Museum, 2022, photo by Dominic Chavez



NEW DEAL RESOURCES FOR MUSEUM PROFESSIONALS



NEW

TRANSFORMING INCLUSION IN MUSEUMS

The Power of Collaborative Inquiry

By Porchia Moore, Rose Paquet, and Aletheia Wittman

Museum workers and lovers can use this book as a tool for engaging with inclusion anew, and as a terrain for collaborative inquiry and world-building that can help us imagine and realize new potential for museums in the future.

June 2022 • 128 pages
978-1-5381-6190-6 • \$40.00 / £31.00 • Paper
978-1-5381-6189-0 • \$95.00 / £73.00 • Cloth
978-1-5381-6191-3 • \$38.00 / £29.00 • eBook

NEW

FROM SMALL WINS TO SWEEPING CHANGE

Working Together to Foster Equity, Inclusion, and Antiracism in Museums

Edited by Priya Frank and Theresa Sotto

Combining practice and guidance, challenges and successes, this book provides a range of frameworks and tools to develop and implement successful DEAL committees and their initiatives. This timely book offers concrete tips and models for mitigating bias, confronting racism, and advocating for organizational change at any cultural institution.

June 2022 • 268 pages
978-1-5381-6359-7 • \$42.00 • Paper
978-1-5381-6358-0 • \$110.00 • Cloth
978-1-5381-6360-3 • \$39.00 • eBook

NEW

MUSEUM ACCESSIBILITY BY DESIGN

A Systemic Approach to Organizational Change

By Maria Chiara Ciaccheri

Museum Accessibility by Design addresses the design of museum accessibility strategy, offering cases, tools and resources to facilitate its critical deployment and guide its evolution in museums through training activities.

July 2022 • 186 pages
978-1-5381-5603-2 • \$45.00 • Paper
978-1-5381-5602-5 • \$95.00 • Cloth
978-1-5381-5604-9 • \$42.50 • eBook

SAVE 20% when you order at www.rowman.com with promo code **AAMPRESS20**

ROWMAN & LITTLEFIELD



www.rowman.com | 800-462-6420



**American
Alliance of
Museums**

2451 Crystal Drive, Suite 1005
Arlington, VA 22202

A BENEFIT OF MEMBERSHIP IN THE
AMERICAN ALLIANCE OF MUSEUMS

We'll see you in

DENVER



**for the 2023 AAM Annual
Meeting & MuseumExpo!**

Denver, CO: May 19–22, 2023



**American
Alliance of
Museums**

Want to stay up to date?

Visit bit.ly/aam-subscribe or
scan the code  and sign up for
“News about AAM’s Annual Meeting.”



Even if you are already subscribed to AAM emails, completing this form edits your email preferences.