Sustainable Preservation

Greening Existing Buildings

Jean Carroon | Foreword by Richard Moe




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I dedicate this book to my late father, Lamar Evan Carroon, a hydraulic engineer who began his career with the U.S. Geological Survey, Surface Water Branch, Water Resources Division in Santa Fe, New Mexico in 1946 and retired in 1980 as District Chief of the Mississippi Water Resources Division. My friend and sister, Barbara Carroon, will understand why.

FOREWORD

IN JUST A FEW SHORT YEARS, the topic of sustainable development has moved from the sidelines to center stage in discussions about climate change, social equity, and economic prosperity—issues that will shape the very future of our planet. This focus on sustainability has enormous implications for historic preservation. It challenges us to think in new ways about the process by which we decide what to protect and how to protect it, about the real economic benefits of our work, and—most important—about the vital role our historic resources can play in reducing our impact on the environment.

By the same token, the practice of historic preservation has profound implications for sustainable development. As champions of wise stewardship of our legacy from the past, preservationists are particularly adept at thinking about the long-term survivability of buildings and how they can be carefully maintained, innovatively reused, and thoughtfully preserved for future generations to enjoy—tasks that represent the very essence of sustainability.

It's easy to forget that every manmade thing in our lives—the computers we rely on, the plastic bottles and aluminum cans we drink from, the buildings in which we live and work—all of them take significant resources to manufacture. Despite the high environmental price we pay for them, we too often think of these things as expendable: Last year's computer gets replaced by a newer model, the plastic bottle gets tossed into the waste basket, the building gets razed to make way for something newer and "better"—all of it done with little regard for the impact of these actions on the world around us. For too long, our attitude toward our natural resources has been, "There's plenty more where that came from." Now, with our environment in crisis, we have to face the fact that there may not be "plenty more" of anything—except trouble.

Consider the ubiquitous plastic water bottle, which has become a symbol of our foolish, callous, and self-destructive treatment of the environment. Despite the fact that good water comes gushing out of faucets everywhere, use of plastic water bottles increased an amazing 1,000 percent between 1997 and 2006. We could recycle these containers, recovering at least some of the energy and materials that went into their manufacture—but the reality is that eight out of ten plastic bottles wind up in landfills. A new understanding is beginning to take hold: Reuse is environmentally superior to recycling. In terms of environmental impact, it's far better to buy a reusable water bottle than to buy an endless stream of plastic containers that may or (more likely) may not get recycled.

The same holds true for construction materials and demolition debris. Recent years have seen an exponential increase in the recycling of these materials—but still, a small portion of building materials gets recycled every year. The rest still winds up in landfills that are rapidly filling up. The conclusion is obvious: Instead of demolishing and replacing a building, it's better to reuse it and avoid creating all that construction/demolition debris in the first place.

Sadly, reuse isn't always easy. Just like disposable plastic containers, much of our postwar building stock was not designed to last. The Brookings Institution projects that by 2035, we will demolish and rebuild approximately 30 percent of our building stock—a staggering 82 billion square feet. This orgy of demolition and reconstruction will be enormously costly, both economically and environmentally, but the fact is that many of those existing buildings will need to be demolished because they're so poorly constructed. "They don't make them like they used to" is more than an empty phrase: It's an indictment of our thoughtlessness—and a mistake we simply can't afford to keep making.

This points up an important fact: In addition to underscoring the wisdom of reusing existing resources, historic preservation offers some valuable lessons on how we should design our new buildings and communities.

Generally speaking, older buildings employ designs and techniques that grew out of the lessons learned from centuries of tried-and-true building practice. In addition, most of them were constructed so that their individual components—such as windows, for example—can be easily repaired or replaced when necessary. Most important, unlike their more recent counterparts that celebrate the concept of planned obsolescence, older buildings were generally built to last. Because of their durability and "repairability," they have almost unlimited *renewability.*

There's also much to be learned from traditional communities that were constructed before the automobile took over our lives. Because they demonstrate a respect for traditional practices that allow manmade structures to exist in harmony with the natural environment, these places offer a vision for how our cities and towns should function in a post-auto-dependent world. No wonder smart-growth advocates and new urbanists embrace the principles these communities embody.

We've always insisted that preservation makes sense, and today that statement is truer than ever. This is not to say that preservationists can rest on their laurels. We still have plenty of work to do. Here's one very important example: While many historic buildings are remarkably energy-efficient, many others—especially older homes—are poor energy performers. We must continue to work on practical strategies for improving the performance of these buildings without compromising or destroying the distinctive character that makes them so appealing.

Happily, an increasing number of green historic rehabilitation projects show we can do just that. Jean Carroon's book *Sustainable Preservation: Greening Existing Buildings offers* case studies that show how a wide range of buildings—from historic icons such as H.H. Richardson's monumental Trinity Church in Boston to modest structures of more recent vintage in communities all over America—can "go green." As one of the country's most experienced and highly regarded preservation architects, with a particular commitment to, and passion for, sensitive stewardship of both the natural and built environments, she is uniquely qualified to explain and illuminate the sometimes-complex relationship between preservation and sustainability.

For some time, preservationists have insisted that in many cases, the greenest building is one that already exists. Now that message is beginning to be heard—and, more important, heeded. Historic preservation has always sustained America by working to protect and celebrate the evidence of its past. Now, by addressing the challenges of climate change, dwindling resources and environmental degradation, preservation can—and must—play a leadership role in the sustainable stewardship of America's future.

Richard Moe
President Emeritus
National Trust for Historic Preservation

ACKNOWLEDGMENTS

"If you look at the science about what is happening on earth and aren't pessimistic, you don't understand the data. But if you meet the people who are working to restore this earth and the lives of the poor, and you aren't optimistic, you haven't got a pulse."

—Paul Hawken,
commencement address to the class of 2009,
University of Portland

MY THANKS TO ALL OF THE PEOPLE across the globe who recognize that heritage and stewardship are essential for a sustainable world and are working hard to make this happen, whether by celebrating the stories of one building or crafting policy that shifts our economic structure to one of repair rather than replace. You empower me with optimism through your actions.

To the many teams that created the case studies in this book and to all of the others I could not use but learned from, thank you. To all of the practitioners I have been privileged to work with, including many great clients and great teams, I extend heartfelt thanks for my education and growth as a practitioner. Lisa Howe was and is an invaluable sounding board, friend and ally in achieving the highest levels of excellence in Goody Clancy's preservation practice and sustainability goals. To my fellow principals and the staff of Goody Clancy who felt "the book" was a never-ending story, thank you for your patience and support. In particular, I could not have started without Kathryn Bossack's initial work on case studies and images, and I could not have finished without Steve Wolf's endless patience with the illustrations and text and Jennifer Gaugler's willingness to help pursue missing pieces. Thanks to the team at Wiley for making this happen, and particularly to John Czarnecki for his persistent belief in the topic and to Amy Odum for her grace and humor.

In the public sector, the publications and leadership of the U. S. General Services Administration were and are invaluable. In the private sector, I relied on the very thorough Building Design + Construction white papers edited by Robert Cassidy and am heartened by Rob's clear understanding that how we address and maintain our existing buildings is crucial in the race to mitigate climate change. Time and again I turned to the dependable and thoughtful information provided by BuildingGreen through their original publications and more recent partnership with McGraw-Hill Construction in the form of *GreenSource* magazine. The BuildingGreen website continues to be the go-to place for case studies and product information and LEEDuser.com provides essential guidance for the U.S. Green Building Council's LEED rating systems. The beautifully written *Women in Green: Voices of Sustainable Design,* by Kira Gould and Lance Hosey, was where I garnered inspiration and comfort. Anything Kira or Lance writes is worth finding; a joint effort is a bonus.

Patrice Frey, of the National Trust for Historic Preservation, provided me with valuable data and thoughtful conversation, but she also challenges and energizes me to find the most effective ways to be a change agent. She is one of my primary reasons for optimism, and I am grateful that the National Trust provides a forum for her voice and others through its blogs. Michael Jackson FAIA, Chief Architect of the Illinois Historic Preservation Agency, is an inexhaustible fount of information and a passionate advocate for sustainable development. His constant stream of links, news bites, case studies and analytical tools is one of the great gifts springing from my involvement with APT, the Association of Preservation Technology. To the many others I know through APT—Natalie Bull, Barbara Campagna, Ralph DiNola, Carl Elefante, Jill Gotthelf, Jennifer Iredale, Andrew Powter, Susan Ross, Walter Sedovic, Ron Staley, Stephen Tilly, Wayne Trusty, and Robert Young to name only a few—who are working to advance "sustainable preservation," thank you.

Last, but never least, anything I accomplish is the result of the love, support, security, and laughter provided by my husband, Michael Payne; my children, Lydia and Carter; and my stepdaughter, Jessica.

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1.1 CLIMATE CHANGE AND BUILDINGS—THE IMPERATIVE

"BE WORRIED. BE VERY WORRIED."

—Time, *April 3, 2006*

"Human activity is putting such a strain on the natural functions of the Earth that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted."

—(2000) United Nations Millennium Ecosystem Assessment

THE NEED FOR IMMEDIATE ACTION to address climate change and the related environmental degradation is increasingly urgent, and the major role that the building industry must take in abating the crisis is unequivocal. Yet, a 2008 survey of design professionals from across the United States found that some still question the actuality of climate change,[1] even though environmental scientists have concluded with unusual unanimity that dramatic change is well under way. Two years before the survey, *Time* magazine trumpeted, "The debate over whether Earth is warming up is over. Now we're learning that climate disruptions feed off one another in accelerating spirals of destruction. Scientists fear we may be approaching the point of no return."[2]

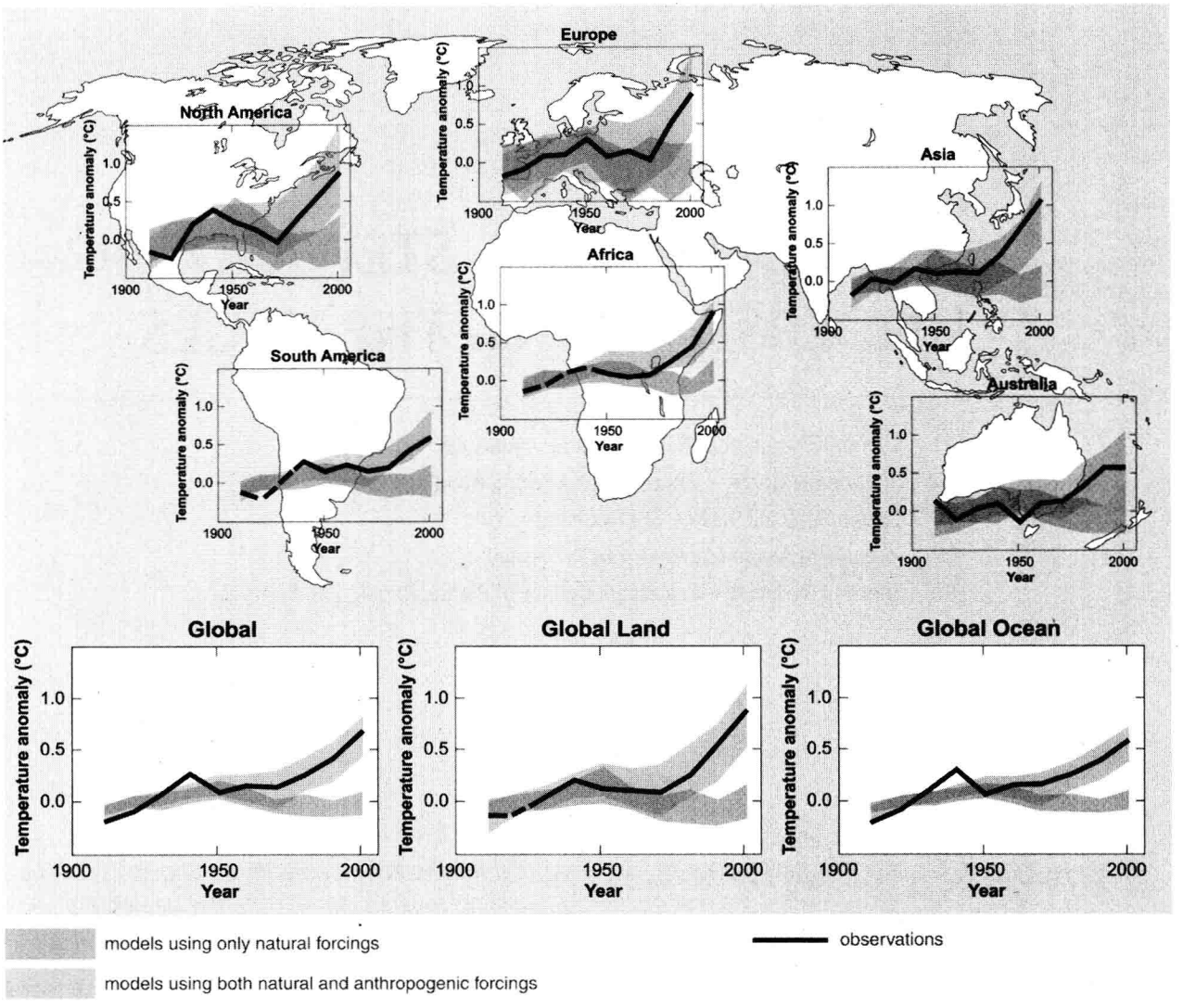

Figure 1-1 Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. *Figure 2-5 in* Climate Change 2007: Synthesis Report *published by the Intergovernmental Panel on Climate Change of the World Meteorological Organization*

The year 2007 was noteworthy because of the new certainty and alarm expressed by international scientific groups about climate change and its rippling effects on ecosystems, biodiversity, geopolitical stability, and economic security. The *United Nations Environment Programme Year Book 2008* announced that climate change "is now recognized as a universal public issue that will dominate global attention for at least a generation."[3]