

Creating Historic Preservation in the 21st Century

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Edited by

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and de Teel Patterson Tiller

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FOREWORD

Looking Forward: Creating Historic Preservation in the 21st Century explores how some United States public policies and professional practice standards for historic preservation should likely change over the next half century. This volume is a compendium of scholarly papers presented at the “7th National Forum on Historic Preservation Practice: A Critical Examination of the Next 50 Years” held in March 2016. The colloquy was called to mark the fiftieth anniversary of the National Historic Preservation Act (NHPA) – the United States’ premier, federal historic preservation law. Over two days, the presenters challenged the audience and each other to consider how historic preservation, both within governmental structures and in the free marketplace, will meet the challenges facing the United States, as well as most other countries with historic preservation programs throughout the current century.

The NHPA created a unique partnership between and among federal, state, and local governments, tribal nations, and the private and nonprofit sectors. The law recognized and legitimized historic preservation as a policy of the federal government. It created such familiar institutions as the National Register of Historic Places – now listing over 1.4 million historically significant properties ranging from historic districts and neighborhoods, archaeological sites, battlefields, ethnographic sites, and individual buildings to entire landscapes, bridges, canals, and other works of engineering. The Act created historic preservation offices in all 56 U.S. States and Territories. Through a subsequent amendment, the Act now includes partnerships with federally-recognized tribal governments and over 2,000 local governments. The law’s success also influenced changes to federal, state, and local tax laws in preserving historic structures and historically significant open space. By any measure, the law signed over fifty years ago, is a success.

Throughout much of the world, historic preservation is a recognized popular force, a mainstream public interest, a legitimate land use, an economic driver, and a fundamental contributor to quality of life and unique sense of identity and place. This is true in emerging countries where heritage tourism is often seen as an important economic engine, as well as in developed countries where historic district are highly sought as residential, commercial, and entertainment areas. Preservation of

architecturally, historically, and culturally important areas thus provides opportunities to introduce visitors to those buildings, districts and towns that citizens value, but also provides those same citizens a link to their past, particularly important in this era of rapid change around the world. As an old Lakota tribal maxim says: “A people without a history is like wind on the buffalo grass.”

At the onset of the 21st century, it is important to ask if the policies and practices that sustained historic preservation in the last century will still be viable in the current century. The world is far different than it was just fifty years ago in our attitudes toward caring for the environment, shifting demographics within and between nations, acceptance of new technologies, economic growth and equality, and education. How the traditional policies and practices of historic preservation will be affected by those drivers of the future is important to understand before we can determine if they will still be valid in the future, or if they must be changed to meet the challenges presented.

The authors of the essays were asked to respond to how historic preservation will be affected by future demographic, economic, technological, environmental and educational changes anticipated in the United States over the next fifty years. For example, in that time period, America’s population will increase by over 25% to 416 million. More importantly, by mid-century, less than half of its citizens will be of Western European ancestry, becoming one the largest majority/ minority nations in the world. Since most of the policies of America’s preservation policies and practices have European roots, how will this new demographic reality change those policies and their implementation strategies? Economists predict a slow growth economy for much of the developed world over the next fifty years. Many counties, including the United States, are seriously considering overhauling their tax structures, to simplify them, generate more government income to pay for more government programs, and to help stimulate their economies. In the United States, with hundreds of different tax credits provided for new technology startups to rehabilitating historic buildings, how will changes in the economy, and tax structures affect current preservation policies and practices?

We live in an age of unprecedented technological change. Our children use electronic devices that we only read about in science fiction stories. Their children will probably be even more dependent on technology. In addition to connecting people around the world instantaneously and cheaply together, technological advances allow us to visit faraway places without leaving our homes. It also provides us with an ever expanding amount of information and data. In addition, technology has produced new

materials and methods of construction that hold great promise in the rehabilitation and restoration of historic structures, but many of the current policies governing substitute materials do not allow them to be incorporated. To date, most preservation practices around the globe have been slow to utilize the current technological revolution. How will historic preservation respond not only to the current technologies that could be applied to information management, material conservation, and documentation, but to those new technologies created over the next fifty or more years?

Today, environmental issues from creating low or zero carbon footprints for new and existing buildings, to expanded research into clean, renewable energy sources, to assessing and mitigating the impacts of sea level rise on coastal communities is at the forefront of many national and international agendas. Additionally desertification, draining of aquifers, changes in plant and animal species traditional habitats, and providing safe drinking water and safely disposing human waste are environmental issues for many countries. A nation's response to these global changes will necessarily affect many existing policies, including those related to preserving historic place. For example, it has been estimated that 10,000 – 15,000 historic structures located on the East Coast of the United States could be underwater if the Atlantic Ocean rises six meters. Current preservation policy cannot address such a massive threat to these resources.

While higher education in preserving historic buildings traces its roots back to 19th century Europe, most graduate and undergraduate programs in historic preservation were founded in the last fifty years. Today, most developed and many emerging countries have university programs or departments devoted to training young people to conserve, restore and preserve their patrimony, including programs in schools of architecture, planning, landscape architecture, interior design, materials conservation, and archeology to name but a few. In addition, as life expectancy increases, a number of preservation programs are targeting non-traditional students with short courses, certificate programs and the like. In addition, higher education itself is changing - how it is financed, how it is administered, and education itself is undertaken remotely rather than inside a lecture hall or laboratory. How will these and other changes in higher education systems affect the curricula of preservation programs during the 21st century?

Historic preservation, a discipline that typically focuses on the past, must prepare for, and be capable of responding to, what lies ahead. We know, within a reasonable doubt and in broad terms, some of the future challenges facing the profession in this century. For these it is imperative

that preservation begin to discuss how its policies and practices will respond to those challenges. Conversely, many future changes will be unexpected. This can only be met with policies and practices that are open to change. As David Lowenthal once observed, the past must be both malleable as well as preserved if it is to remain relevant for future generations. The editors hope that this volume begins to create the future of historic preservation in the 21st century

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CHAPTER ONE

TOUGH DECISIONS AND EXCITING POSSIBILITIES: PRESERVATION'S NEXT 50 YEARS

JOHN ENGLANDER

Though history is an endless continuum, in 2016 we had come to a moment in time from which it is valuable to look back and to look ahead: the fiftieth anniversary of the U.S. National Historic Preservation Act (NHPA). Though it may be seen as just a line in the sand, it is a valid vantage point allowing us first to survey the past half-century of preservation progress and professional development. Then perhaps even more important, is to use the time perspective to try to discern the sweeping changes ahead. It is an opportunity to pause as we look to the future, to a world that is surely changing faster than our ancestors ever could have imagined.

There are limits, however, to how the past will show the future, reflected in the words of Edmund Burke, Irish statesman and member of the British Parliament some three centuries ago, “You can never plan the future by the past.” As guardians of history, those responsible for preservation have more and more aging assets in need of conservation and protection. Properties suffer from the usual deterioration, plus the new stresses of a changing physical environment, most notably our rapidly changing climate. In addition, lesser noticed, but just as important factors – demographics, economics, education, and technology-will dramatically affect the future of historic preservation.

While preservation professionals will face very tough decisions in the era now unfolding, there are also some exciting possibilities. As I considered my message for this perspective, I penciled an alliterative phrase that has stayed with me and perhaps should be the subtitle: *Triage and Technology for our Timeless Treasures*. Like emergency responders at disaster scenes who do triage, preservationists are going will need to make wrenching choices, using a similar three-category rating. They will have to make decisions separating treasures according to: 1) assets that are safe

and should not take scarce resources; 2) those that need attention as a priority given a determination of high value, vulnerability, and ability to be preserved at an acceptable cost; and 3) things that sadly are at high risk, but either truly are unable to be saved, or that have a poor cost-value ratio.

This is the reality of life. Despite the tough decisions, it should be gratifying to know that in most cases, we have the ability to preserve that which is most important, given our resources, priorities, and technology. Making those choices and exercising that stewardship is a weighty responsibility, but it is also an opportunity, and I might suggest, even a privilege. To get started, it is useful to look back fifty years, to the era when historic preservation was legislated in the United States. Many involved with preservation will likely fall into my demographic group, the “Baby Boomers” still one of the largest cohorts in the United States. Despite the line of the late comedian Robin Williams, “if you can remember the ‘60s, you weren’t there,” referring to an era with notable drug use, most of us can recall the year the National Historic Preservation Act was passed. In addition in the 1960s global population was less than 3 1/2 billion, less than half of today’s seven plus billion. *The Population Bomb* by Paul Ehrlich was a popular and controversial book published in 1968. The first episode of the original *Star Trek* television series was shown; the first *Star Wars* movie had not even been written. Most U.S. televisions had a choice of three national networks, with those in urban areas perhaps a dozen channels overall. While most of the bulky boxes were color televisions many people still had black and white sets. Telephones were hardwired, cell phones were still twenty years in the future. Handheld radio transceivers known as “walkie talkies” were mostly used by the military and police. Computers were unfamiliar to the general population, IBM and a few companies were making early-stage computers that required specially engineered rooms. Programming was done by a large stack of cards with punched holes, or by magnetic tape. Science Fiction movies still relied on elaborately painted sets and backdrops. Holograms were just being invented, building upon the invention of the laser in 1960. The National Aeronautics and Space Administration (NASA), was preparing for a first flight to the moon in 1968 and the lunar landing the following year. Global Positioning System (GPS) was still almost a decade away. The U.S. Federal Drug Administration approved the birth control pill allowing better family planning, and arguably more sexual freedom. DNA was finally decoded ushering in the huge field of microbiology. Walt Disney died; Halle Barry and John Cusack were born. Lyndon Johnson was president of the U.S., and the country was getting consumed by the war in Vietnam. The U.S. made a commitment to historic

preservation with the National Historic Preservation Act.

Indeed a tremendous amount of change has happened in the ensuing fifty years at an astonishing pace. That half-century had a different character to the previous centuries, dominated by the technology explosion and a globalized, interconnected world. My point here is to see the pace of change, as we attempt to peer into the future to what lies in store for historic preservation over the next fifty years. The caveat is the humorous line from famous physicist Niels Bohr who said, “It is exceedingly difficult to make predictions, particularly about the future.” Looking ahead, what can we say with certainty or at least reasonable confidence? Let’s use the five drivers or perspectives that were identified in 2016 for the Seventh National Forum on Historic Preservation: Demographics, Economics, Technology, Environment, and Education.

Demographics

In 2016 there are approximately 7 1/2 billion people on the planet. Experts expect the global population to stabilize by mid-century at roughly 10 billion. In the U.S., population is estimated to continue a modest but steady growth, though that depends somewhat on immigration policies, a subject that is becoming more and more hotly contested in many different countries. Changing population dynamics will affect the audience for preservation, their propensity to give financial support, and will greatly influence the way they will hear, experience, and assimilate information. Variations will come from both language and culture. What can we reasonably infer about the population over the coming half-century?

Ethnic groups typically considered minorities will likely swell in numbers. In the United States there will be more Hispanics, more Asians, and likely more Africans. The distribution of ages will vary significantly. Well before 2066, the Baby Boomers will be declining in numbers, while the Millennials will have an increasingly large presence. There is some indication that their interest in history is good, but more for the factual rather than the fictional genre, a promising characteristic for preservation.¹

Speaking of declining populations, except for the few who will choose to be frozen cryogenically, cremation rather than burial will likely continue to increase as an option after death. Though perhaps macabre,

¹ ”History, yes. Science, sure. Sharks, Yes: what millennials want from factual TV”, The Guardian, April 13, 2005
<https://www.theguardian.com/technology/2015/apr/13/what-millennials-want-from-factual-tv>

cemeteries are an important aspect of history. Traditional cemeteries will likely be less common as a final resting place in the years ahead, both due to a shortage of space and more frequent flooding in coastal cemeteries. Already there have been rather ghastly cases of caskets or remains surfacing in low-lying areas during hurricanes and extreme floods. That will become more widespread with the increased flooding from record levels of rain and rising sea level and warrants special consideration from a historical preservation perspective.

As we look at demographic differences and cultures, we need to consider the melding of different cultures, but also the persistency of ethnic behaviors and attitudes. The latter, the durable nature of cultures, may enhance support and create marketing opportunities. In other words, the ethnic “melting pot” and Americanization is real, but various peoples, whether they be Hispanics, Indians, Chinese or of other ethnicities will also hold onto many of their cultural and sacred traditions. Consider the high reverence that those cultures have for their ancestors. The fact is that while we like to modernize quickly in terms of technology, cars and other transportation, and conveniences, we cling to our cultural habits for centuries, in ways we tend to overlook. As an amusing but telling example, consider the compulsive “God bless you” or *gesundheit* whenever someone sneezes. In contrast a cough elicits nothing. Why? According to *National Geographic Magazine* the root of the obligatory sneeze response is that Pope Gregory I ordered it in the year 590 AD, to ward off the often-fatal plague, of which sneezes were an early symptom.² Fifteen hundred years later, the cultural habit is deeply ingrained, without any purpose or rationale whatsoever. The point is that cultures are very persistent. Traditions may require accommodation, but may present opportunities. While most Americans have modest historical/cultural interest, my perception is that Hispanics, Asians and even some Africans have a higher regard for their ancestors and traditions. That could bode well for preservation.

Environment

Unfortunately, climate change over the next fifty years will present serious new challenges in almost every aspect of life. In 2016, we have a planet that is approximately one and a half degrees Fahrenheit warmer than at the start of the Industrial era (roughly one degree Celsius). According to NASA, the U.S. space agency, for the third year in a row,

² Patrick, Bethanne Kelly; Thompson, John Milliken (2009). “An Uncommon History of Common Things”. National Geographic. p. 74. ISBN 9781426204203.

2016 set a new record as the warmest year since the start of meteorological records in 1880.³ Besides more extreme heat, climate change manifests as more extreme drought, wildfires, record rainfall, and even heavier snowfall in certain places. Despite seeming to be a contradiction, at least for many decades to come, record rain and snow both will likely be more frequent. As warmer oceans cause greater evaporation that moisture must come down as either rainfall or snowfall.

The point is that “weird weather” is likely to be the new normal for the next half century and beyond, affecting structures, buildings, drainage, transportation networks, and more. *New York Times* columnist Tom Friedman refers to this as “global weirding” rather than the common term global warming to recognize the extreme weather as climate goes into destabilization mode.⁴ In the very best case scenario projections for the next half-century, we will likely have an additional degree Celsius of temperature increase (almost two degrees Fahrenheit), which is double that amount of warming that has occurred since 1750, the year generally used by the climate science community to mark pre-industrial.⁵ In the worst-case scenarios, it could be double that again.

Warming in the Arctic is already about two degrees Celsius, or three and a half degrees Fahrenheit, warmer than the last century. The high northern latitudes have been warming much more aggressively than the south due to the tilt of the Earth, the location of the landmasses, and the prevailing ocean and atmospheric currents. Both floating sea ice and ice on land are melting at accelerating rates. In the case of the glaciers and ice sheets on land, that melting results in higher sea level. Surprisingly, the melting of floating icebergs, has no direct effect on sea level. Ice has to be on land for melting to affect the ocean height either as the melt water runs to the sea, or the glaciers break off into icebergs and become floating ice. That is the moment when they alter sea level.

Sea level rise is already causing increased flooding in coastal communities worldwide. It is usually observed during peak lunar high tides, often-called king tides as illustrated in Figure 1 with historic Stranahan House in Fort Lauderdale, Florida.

³ NASA, NOAA “Data Show 2016 Warmest Year on Record Globally”, <https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally>

⁴ Friedman, Thomas. “Global Weirding is Here”. *New York Times*, February 17, 2010 <http://www.nytimes.com/2010/02/17/opinion/17friedman.html>

⁵ *Defining Pre Industrial*. Climate Lab Book <https://www.climate-lab-book.ac.uk/2017/defining-pre-industrial/>



Figure 1. The seawall at Fort Lauderdale's Stranahan House now routinely floods due to rising sea level, most noticeable at the full moon high tide. Built in 1901 it is the oldest structure in Broward County. Photo: City of Fort Lauderdale, Florida

This is only the beginning. The trends of warming, melting ice and rising seas will almost certainly continue for decades, due to the fact that the oceans absorb and store most of the excess heat. In general warmer temperatures, more extreme weather conditions, and flooding that is more frequent and more extensive pose very real threats to historic structures and communities. This will create increasing challenges and tough decisions for curators, engineers, management, and boards of directors.

Almost certainly there will need to be great efforts to slow global warming over the coming century. Our society will very likely find ways to stop adding to carbon dioxide and other greenhouse gases to the atmosphere. In some situations historical preservationists may see opportunities to reduce the greenhouse gas emissions of specific properties, presenting both an educational opportunity, as well as a complication in terms of changing the historical authenticity. Some of these will be interesting indeed. For example, as I write this, there is tremendous irony that the Coal Museum in Kentucky is switching to solar energy.⁶

On the side of reducing the global warming, in December 2015 the Paris Climate Agreement was established among 196 countries recognizing

⁶ "Kentucky Coal Museum switching to solar power". CNN April 6, 2017. <http://www.cnn.com/2017/04/06/us/coal-museum-goes-solar-trnd/index.html>

the serious threat posed by warming temperatures, changing weather patterns, melting ice and rising seas. The Paris Agreement set a goal to limit additional warming to one additional degree Celsius (1.8 degrees Fahrenheit), in the coming decades by reducing greenhouse gas emissions. It allowed great latitude in how they do that and the timeline to achieve it. Even if the nations are able to reach the goal, we would have double the warming of the last century.

The reality is that more ice will melt. Weather patterns will change further. Sea level will rise much further, not only affecting the coast, but expanding marshlands and reaching far up tidal rivers. Rising sea level is easily confused with other flooding but deserves to be understood clearly. It is different than the temporary flooding from storm waves on the coast and from extreme high tides, particularly the king tides during the full moon, though it makes both of them worse.

Rising sea level is essentially a long term increase in ocean height and finds its way to low areas even far from the coast. It will move shorelines for centuries and millennia. Thus it is a special category of environmental challenge. The bad news is that sea level rise is now unstoppable and will continue for centuries regardless of efforts to slow the warming by reducing greenhouse gases. The good news is that rising sea level is relatively slow, providing a special opportunity to do some long range planning to protect historic assets. In some situations, defensive structures like seawall, pumps, or levees will work for a while. Otherwise options of elevating buildings or relocating them need to be considered, in spite of the fact that each of those options may challenge principles of preservation purity.

Slowing and reversing climate change will, of course, require global cooperation. The rise in greenhouse gases, principally carbon dioxide, is affected by the worldwide emissions and energy production. For millions of years the level of CO₂ has ranged from about 180 – 280 PPM (parts per million). It is now over 400 PPM, some 40% higher, and climbing like a rocket as shown on the graph in Figure 2.

We are at a moment of profound and unprecedented historical change, on a geologic timescale. Until recently sea level changed on a natural cycle of roughly one hundred thousand years, moving up and down approximately 400 feet, or about 120 meters. For the last 5,000 years of ocean height and the shoreline seemed to have been relatively stable. In fact, we were transitioning from the natural up phase, to the down phase. We were at the turning point, an era of super warming as can be seen

clearly on the graph below.⁷ Geoscientists want to give it a new designation, the Anthropocene to recognize that we have left the eleven thousand year Holocene, a relatively stable period following the last “Ice Age.”

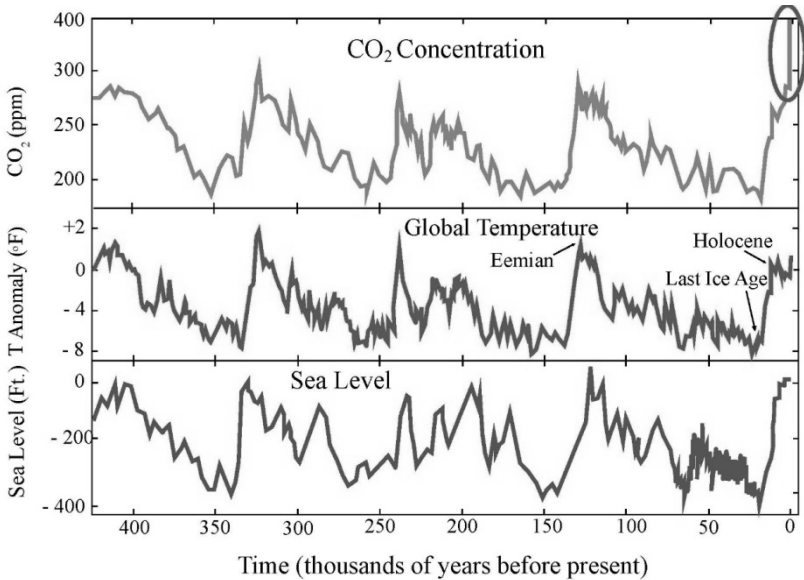


Figure 2 Carbon Dioxide (CO₂), global temperature, and sea level move in synch over long periods of time as shown on the graph above. The three charts show 400,000 years, effectively four “ice age cycles”. We are now in an era of extraordinary rise in the level of CO₂ and other greenhouse gases. While there is a lag time of decades or centuries, fundamental physics and thermodynamics strongly suggest that temperature and sea level will continue to rise significantly over the 21st century. Graph by Author.

One of the aspects of climate change that makes it different from traditional environmental issues is its global nature. With issues such as water and air pollution, local actions had considerable local effects. Because carbon dioxide and other greenhouse gases blend globally rather quickly, reduction in local emissions will have almost insignificant effect. It will take collective global action to slow and eventually reverse climate

⁷ Englander, John. *High Tide On Main Street: Rising Sea Level and the Coming Coastal Crisis*. The Science Bookshelf. Second Edition 2013

change. Thus even if a local area eliminates the use of fossil fuels entirely, it will have no substantive impact on local temperatures or rising sea level. Paradoxically we have entered this new era where we need to look at global actions and policies, but deal with the problems that we encounter locally.

From a historical perspective I find it fascinating that one of the first references to the problem that burning fossil fuels would warm the atmosphere, was made by Alexander Graham Bell in 1917, inventor of the telephone. He appears to have been the first to use the term “greenhouse effect” and even advocated that we explore solar energy as a logical alternative to coal and oil. Even with the Paris Climate Agreement of December 2015, substantial warming will continue. Vast areas of Arctic glaciers and ice sheets will now melt unavoidably raising sea level. Greenland is most significant as it is about as large as the eastern United States and covered by ice averaging more than a mile deep (almost 2 km). West Antarctica is nearly twice the size of the U.S., but not yet melting nearly as fast as Greenland. According to the latest NOAA (National Oceanic and Atmospheric Administration) average sea level rise by 2060 may reach three feet above present levels. By the end of the 21st century, it could be as high as eight feet under extreme scenarios.⁸

While it is still possible for us to slow the warming and avoid the worst scenarios, caution and responsible planning warrant that we need to consider how to adapt prepare for the worst predictions. Not since the rise of modern civilizations will sea levels be as high as predicted over the next 50 to 100 years. For reference, the last high water mark was one hundred twenty thousand years ago, when ocean heights were about twenty five feet higher than present.

Obviously just a few feet of higher base sea level would have tremendous impact on historic preservation in many coastal areas. For example, it has been estimated that over 10,000 historic buildings and districts located on the East and Gulf Coasts of the United States will be underwater with just three feet of sea level rise.⁹

⁸ Sweet, W. et al, *Global and Regional Sea Level Rise Scenarios for the United States*. US Department of Commerce, NOAA Technical Report NOS CO-OPS 083, January 2017

⁹ Horowitz, Ann. *The Effects of Sea Level Rise on Historic Districts and the Need for Adaptation*. MAHP Thesis, Goucher College 2013.

Economics

How to pay for preservation is currently a challenge, and will continue to be so over the next 50 years. Since passing the NHPA in 1966, preservationists in the U.S. have mostly developed and relied upon tax credits, tax abatements, and grants from federal, state, and local government agencies to fund surveying, designating and rehabilitating and restoring historic buildings, structures and landscapes. Funding for historic preservation in the United States has also come from large and small foundations, as well as single-purpose nonprofits that typically support the work of a particular historic site.

As we enter the second fifty years of the 1966 Act, U.S. federal, state, and local budgets are generally overcommitted. This is not only true of the U.S., but of almost all nations that have significant historic structures and buildings preserved in part by the public sector. Particularly in the United States there have been repeated efforts to push the burden of programs from the national to the state and local level due to budget pressures. At the risk of painting the problem with too broad a brush, as societies mature furthering entitlements and subsidies, budgets become constrained, due to a number of factors including rising expectations of social services provided by governments, decline of birth rates and increases in life spans among other reasons. In other words, while priceless cultural resources seem important, so does education, healthcare, defense, scientific research, the vast array of social programs, – not to mention the interest on national and local government debt.

By 2066, expected changes in the population of the United States, particularly declining birth rates and aging population, along with the changing technologies that will require less workers per output, the rise of the shared economy, and the potential loss of the dollar as the world's currency could result in a slow growth or no growth economy. This will mean that fewer resources will be available for preservation activities, unless they are seen, as they are not currently, as central to life in the U.S., or for that matter any other mature society. Additionally, the often-discussed move to a simpler “flat tax” in the U.S. would presumably eliminate most deductions except home mortgages and charitable deductions. It would also likely eliminate investment tax credits for historic rehabilitations and restorations, along with most state and local tax deductions and abatements.

As we enter the next half-century we appear to be entering a world of anti-global nationalism with more borders, tariffs, and restrictions to commerce. Such economic nationalism will not only have social and

cultural consequences, but would affect how the market economy operates. Globalization spurred economic growth by expanding markets and sourcing goods and services where they are more economical to produce. Academic and business literature is rather consistent about the economic advantages of unfettered trade in goods and services. A 2017 article in *Forbes Magazine* is a good example: “Economists Say ‘Economic Nationalism’ is Economic Nonsense.”¹⁰ As we look ahead to the next fifty years it is difficult to discern how this battle about the market economy will evolve. Within North America and Europe there are increased pressures for isolationism. Growth in the internal economies of China and India, along with their increasing leadership on the world stage could impact a shift the center of gravity for global trade.

The rehabilitation and restoration of hundreds or thousands of historic structures and buildings in the U. S. and many other countries occurred during the huge growth in the global economy during the half-century. Changes in national and international policies, both in terms of trade and overall growth, could greatly affect how preservation is financed in the future. In addition to government funding and private philanthropy there may very well be some innovative financing including hybrids. As an example from the arena of civil infrastructure, many roads, ports, and bridges are being financed by public-private partnerships. It is conceivable that some hybrid of private financing could be used to leverage the traditional support from government and private foundations.

Education

Education directed at historic preservation is a small field. Its growth or decline will likely reflect both the health of the larger institutions of higher education as well as the health of the historic preservation movement—the core issue at hand. Before addressing this specialized arena, it is good to look at the wider field. At least in the United States, education, particularly higher education, is generally in turmoil, which might presage collapse of some educational institutions and programs, leading to the creation of some new ones. Education has increased in cost to the point that some change is inevitable. Fortunately a number of new forums, formats, and technologies are presenting themselves.

¹⁰ Anderson, Stuart. “Economists Say ‘Economic Nationalism’ Is Economic Nonsense” *Forbes Magazine*. February 25, 2017
<https://www.forbes.com/sites/stuartanderson/2017/02/25/economists-say-economic-nationalism-is-economic-nonsense/#657153ae306f>.

Longshoreman, philosopher, and sociologist Eric Hoffer wrote: “In a time of drastic change, it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists.” It’s a thoughtful and thought provoking view of the need to learn and adapt in a time of rapid change. Though he penned that in 1973, it seems relevant today.

The cost of higher education in the U.S. has risen to levels unimaginable in 1966. In 2016, it is fairly common that four years of a moderate college program can cost as much as two hundred thousand dollars. That is causing levels of debt that seem “insane” to many, a burden on students and their families. And it is not just the four years of college, or even the various graduate programs. In many areas private elementary, middle and high schools seem required for a good education and to get into a good college. The costs of those private schools can be twenty or thirty thousand dollars per year.

There is widespread concern about the state of American education generating interest in competition, the use of negotiable school vouchers, and privatization. Resistance is strong from within the educational system. It is a dynamic political arena that cuts across many socio-economic boundaries. Nonetheless, at the cusp of the second half-century for historic preservation, it is reasonable to foresee a few likely trends. It is quite probable that in the coming decades, there will be more online education, with more diverse course structures and completion certificates.

A decade ago, in 2006 we saw the advent of MOOC’s (Massive Open Online Courses). Within five or six years, dozens of institutions, e.g. Harvard, Stanford, MIT, were participating in various versions. By 2016 there are literally thousands of such courses offered online, with or without degrees and certificates, and with varying costs, including “zero.” Such nontraditional courses will likely continue both to offset the problem of escalating costs and the inability of the system to satisfy the demand.

Looking ahead I have just two other impressions about education that would be relevant to teaching about historic preservation. First, education seems to be going in the direction of greater practicality, even more vocationally oriented. Perhaps that will encourage teaching the culture, craft, and professional skills required for preservation. That could present challenges as well as opportunities for curriculum.

Today there are a limited number of higher education facilities with strong programs in historic preservation. Aging assets will increase challenges for preservation in the next half century, possibly increasing demand for more educational program capacity, the lack of a strong discipline focus, almost non-existent track record of obtaining significant

outside grants or contracts, and the low enrollment in almost all graduate preservation programs in the U.S. does not bode well for these programs in the near term. It will take extraordinary advocacy within the ranks of the historic education sector to maintain even the number of programs that currently exist.

On the other hand there likely will be more programs and courses of adult education, for second – or even third – careers bringing in mature people for whom history and preservation is likely more of an avocation and love rather than an initial career. That might be a source of more volunteers, docents, as well as paid staff members possibly with lower needs and expectations for career salary, advancement path, and benefits. The point is that the educational system has changed greatly, almost certainly with more to come. Education leads well to the fifth and final theme of this conference and volume, i.e. technology.

Technology

Technology is woven into almost all aspects of our lives from very inexpensive powerful computers, graphic software, smart phones, internet, embedded chips, GPS, and radio frequency devices hidden behind the bar coded price tags. Though we at times are overwhelmed by this technology, particularly when something does not work properly and is beyond simple fixing, it is hard to imagine our lives without such daily tools for work productivity, communication, and transportation. In addition we have had remarkable advances with materials, protective coatings, and the ability to faithfully repair or recreate everything from artwork, to fabrics, to utensils that are virtually identical to the originals, except for the patina of actual age. Those tools are valuable options for preservation. Looking ahead over the next 50 years, we can expect the technologic pace of innovation to continue and likely accelerate.

To conclude this perspective let us take a virtual journey to the far end of our horizon, a full century from passage of the NHPA. In the year 2066 we can visualize a daunting problem as a way to consider how the community and profession might deal with it. One of my specialties is sea level rise. As described above it is quite clear that rising sea level will be with us for centuries. It cannot soon be stopped regardless of efforts to reduce carbon emissions or other efforts related to sustainability, although it can be slowed. It is not possible to know exactly how quickly the glaciers and ice sheets will melt as we get into the second half of the century. In part it depends what the world does with the consumption and production of energy by burning fossil fuels and thus adding greenhouse

gases that warms the atmosphere. There will be hundreds and eventually thousands of coastal communities going underwater like Sharps Island in the Chesapeake Bay or parts of Santorini, the Mediterranean village now, like the mythical Atlantis, underwater.

More than even preservation can help put future changes in perspective. This makes it ever more important, but perhaps with some new rules. For example, as is already being done in several cases, structures can be elevated, slightly disturbing the exact historic relationship to the ground, but little else. Or they can be relocation to higher ground, which is much more disruptive to the context of the asset, as well as more difficult to execute. Looking back at the earlier photo of Stranahan House in Fort Lauderdale, it will be a prime candidate for elevation or relocation, perhaps by mid-century. Much thought will need to go into which is the right approach. That will largely depend on the rate of the increased flooding and what happens in the surrounding community. In other cases, the size or structure may not lend itself to elevation or moving, such as an entire village, or a large stone fort. Castillo de San Marcos in St. Augustine Florida, shown in Figure 3, may be a good example where raising or moving the structure intact is not realistic.

It seems to me that before such a historic structure is allowed to be taken by the sea, an option might be to do detailed documentation including high definition 3D photography and holography. That would be a possible way to remember, understand and appreciate the priceless things we want to preserve, but cannot physically retain. Or perhaps as a hybrid solution, significant features such as the entrance gate could be relocated to higher safe ground to provide a sense of realism. Then using modern techniques and technologies, the visitor moves through the physical historic entrance and entered a virtual reality rendering of the old fort, such that they could walk around and experience it just as visitors do today. Then they might move to a museum with actual artifacts and of course the inevitable gift shop.



Figure 3 Castillo de San Marcos, in St. Augustine, Florida the oldest masonry fort in the continental U.S., completed in 1695 is already in the flood zone during extreme high tides. Preserving it will present a special challenge as sea level rises over the coming decades. It may present an opportunity for non-traditional approaches, including technology. Photo: National Park Service.

There is one new technology that will surely be controversial. Over the past few decades 3D printing, otherwise known as additive manufacturing, has made giant strides. From customized pieces to replacement parts on demand anywhere on the globe, it is seen as a game changer. Whole houses are being built via the process. Understandably many in historic preservation would find a plastic material replica to be anathema. Could it allow the possibility of very authentic looking replica's in the situations where the originals literally no longer exist, are quickly deteriorating, or must be recreated. Time will tell. It is the time to recalibrate the rules of preservation for the next half century, for as one of my heroes, Rachel Carson, said: "To understand the living present, and promise of the future, it is necessary to remember the past."

As an afterword, I would like to share how I came to preservation, to reinforce a capacity that many preservationists may not fully appreciate. My conversion was only recent. In 2014, I was invited to give a plenary presentation for the National Trust for Historic Preservation Annual Conference, held in Savannah, Georgia. I explained how rising sea level was now unstoppable and would force us to rethink concepts about our civilization not only on the coast, but through the *low country* and far up

tidal rivers.

Since my book *High Tide On Main Street: Rising Sea Level and the Coming Coastal Crisis* was published, I had been focusing on the future, trying to help individuals, businesses, communities, and security organizations, to plan for much higher sea level. The farthest thing from my mind was old buildings. I was a “futurist” trying to help people plan and adapt for the next half-century, and even the next century. I was being successful at making a powerful case that rising sea level is now unstoppable, that it will likely be higher than most of the projections, that it will raise the impact of storms and extreme tides—but is different because they recede in hours, making it possible to rebuild, whereas higher sea levels will not go down for a thousand years or longer.

The problem I kept encountering was that in America’s “instant gratification” society, where results are measured in quarterly profits and where five years is often considered long term planning, and where even the military and national security often used a time horizon of a decade or two, that it was difficult for most audiences to be concerned about something that would happen gradually over 50 years. Then I discovered your world, preservation. Surprisingly it was the ideal forum to consider rising sea level. Buildings and cultural assets were being flooded *now* — more and more often. Preservationists protect treasures that are priceless, changing the normal valuation paradigm. Preservationists are passionate about their work. Looking at timescale of only fifty years is almost short term planning for preservationists. In other words, preservationists are the perfect community to see what was at risk from rising sea level and to see the need to understand, to plan, and to adapt. It seems to me that is an apt perspective to recognize a subtle significance of historic preservation in a rapidly changing world as we tackle tough decisions and exciting possibilities.

CHAPTER TWO

WADE IN THE WATER: ADAPTING HISTORIC RESOURCES TO SEA LEVEL RISE

ANN D. HOROWITZ

Scientists project that global sea level rise impacts—recurrent flooding, permanent inundation, storm surge, and coastal erosion—will escalate by century’s end. Although sea level rise effects are generally difficult to discern on a day-today basis, harbingers of change are evident across the coastal United States. Recurrent flooding that often makes city streets impassable was ten times more likely in Norfolk, Virginia and six times more frequent in Charleston, South Carolina between 2007 and 2013 than it was between 1957 and 1963¹ (Figure. 1). Hurricane Sandy pummeled Northeast coastal areas with up to 14-foot storm surges while the highest recorded storm surge of over twenty-five feet occurred during Hurricane Katrina on the Gulf Coast.² Rapid coastal erosion caused the emergency evacuation and the eventual demolition of an apartment dwelling in Pacifica, California and the relocation of the historic Gay Head Lighthouse in Aquinnah, Massachusetts on the island of Martha’s Vineyard.

¹ National Oceanic and Atmospheric Administration, “NOAA: ‘Nuisance flooding’ and increasing problem as coastal sea levels rise,” July 28, 2014, http://www.noaa.gov/stories/2014/20140728_nuisanceflooding.html.

² National Center for Atmospheric Research, “Dissecting Sandy’s Surge,” n.d., <https://www2.ucar.edu/atmosnews/perspective/8585/dissecting-sandy-s-surge>. Ann Green, “Storm Surge: Lessons from Katrina,” Autumn 2006, <https://nseagrant.ncsu.edu/coastwatch/previous-issues/2006-2/autumn-2006/storm-surge-lessons-from-katrina/>.



Figure 1: Street flooding is common in Alexandria Historic District during high tides and storm events. Photo: Author.

Not only are a municipality's critical public safety and transportation facilities threatened by sea level rise impacts along tidal shorelines, but also, the economic stability of residential and commercial neighborhoods, and the longevity of significant historic resources that establish an area's cultural heritage. An estimated 15% of National Register listed properties in coastal states are at risk of damage or destruction due to sea level rise impacts within the next fifty years.³

The number of vulnerable historic properties increases when considering state and local historic resource listings as well as properties with no formal designation, further eroding the cultural identity of a place. Many of these historic properties and districts are critical to the interpretation of the country's earliest settlements, such as St. Augustine, Florida; Alexandria, Virginia; and Annapolis, Maryland (Figure. 2). Recurrent flooding, storm surge, and erosion will occur more frequently along all

³ Ann Horowitz, *Identifying Historic Resources Vulnerable to Sea Level Rise: An Urgent Need to Preserve the Early American Record*, unpublished document, Goucher College, December 18, 2012.

U.S. tidal shorelines to varying degrees in the next 50 years, prompting the need for new public policies and practices designed to adapt to the environmental alteration of our shorelines.



Figure 2: Seawalls have historically protected America’s oldest continuous European settlement, St. Augustine, Florida, from flooding, storm surge, and erosion. Illustration by John S. Horton, 1855, Library of Congress Geography and Map Division.

Global projections of the Intergovernmental Panel on Climate Change (IPCC) for up to a one-meter (3.3 feet) sea level rise by 2100 are often interpreted as applying evenly to all of Earth’s coasts.⁴ This assumption is generally incorrect. Sea level rise heights are a local phenomenon, as distinctive as each community’s societal characteristics and unique cultural heritage. Tidal range, wave height, coastal slope, historic shoreline changes, geomorphology, and local sea level rise history combine to form a Coastal Vulnerability Index (CVI) unique to each locality.⁵ For example, the mid-Atlantic and Gulf Coasts are subsiding, resulting in a higher sea

⁴ Real Climate, “Sea level in the 5th IPCC report,” October 15, 2013, <http://www.realclimate.org/index.php/archives/2013/10/sea-level-in-the-5th-ipcc-report/>.

⁵ United States Geological Survey, “Relative Coastal Vulnerability Assessment of National Park Units to Sea-Level Rise,” September 1, 2009, <http://woodshole.er.usgs.gov/project-pages/nps-cvi/>. The Coastal Vulnerability Index (CVI) is composed of six interactive variables, which project the effects of sea level rise along shorelines. Measures for tidal range, wave height, coastal slope, historic shoreline changes, geomorphology, and history of sea level rise are analyzed to accurately project an area’s specific vulnerability to sea level rise.

level rise rate while parts of northern Washington state and Alaska have a negative rate of sea level rise due to geographic uplift.⁶

Because sea level rise impacts are local, adaptation strategies are specific to communities and regional areas. Although the steps toward implementing adaptation strategies are the same, each community develops a unique blend of protective methods, tailored to local risks and resident values. Adaptation does not provide a one size fits all solution. Where recurrent flooding disrupts daily activities or post-storm effects have caused damage, multi-disciplinary teams of governmental officials, business leaders, and residents have collaborated to plan local adaptation strategies that protect the tax base and infrastructure as well as vital economic, public safety and transportation institutions. Some plans incorporate sea level rise projections while others only consider current conditions.

Historic resources, however, are often overlooked by adaptation planning scenarios, despite the critical quality of life—economic, social, cultural, and environmental—benefits they provide communities. Civil engineers, coastal scientists, and emergency management personnel have been traditionally the primary players in adaptation planning; however, they lack the expertise of historic preservation professionals, a group that is often absent from adaptation planning discussions. This has resulted in a lack of advocacy for historic properties, primary contributors to a community's unique sense of place.

Protecting community historic identity may not rank at the top of a municipality's adaptation plans when the essential elements of a society such as emergency facilities, transportation networks, and places of employment are at risk of flooding, storm surge, and coastal erosion. It is important for local decision makers and stakeholders to understand, however, that historic markers of an area's cultural past are also essential to a community's resiliency, ability to adapt, and economy. Researchers Jeremy J. Hess, Josephine N. Malilay, and Alan J. Parkinson have identified that "a focus on place promotes resilience because identity and sense of place are central to community resilience, public health, and well-

⁶ National Oceanic and Atmospheric Administration, "Sea Level Trends," n.d., <http://tidesandcurrents.noaa.gov/sltrends/sltrends.html>. 7. Jeremy J. Hess, Josephine N. Malilay, and Alan J. Parkinson, "Climate Change: The Importance of Place," *American Journal of Preventive Medicine* 35:5 (November 2008). 8. Federal Emergency Management Agency, *Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning*, (Washington, DC: Federal Emergency Management Agency, 2005), http://www.fema.gov/pdf/fima/386-6_Book.pdf.