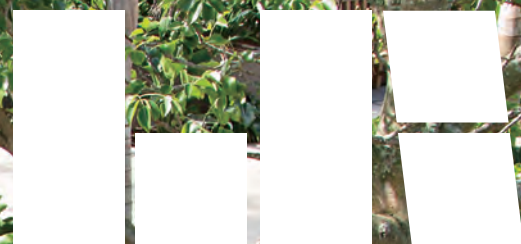


风景园林

Landscape Architecture



CN 11-5366/S
ISSN 1673-1530

ISSN 1673-1530



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健康景观

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Water Adaptive Spatial Characteristics of Traditional Towns Along the Grand Canal in Southern Shandong Under the Influence of the Grand Canal and the Yellow River

01/2023

210 VOL.30

中国科技核心期刊

PREFACE

Landscape for Health

After experiencing the pandemic that has lasted for 3 years, feeling the increasingly prominent climate changes, such as droughts, mountain fires and heavy rains, and witnessing the gaming and negotiation in COP26 for global countries to reduce their emissions and control the global warming under 1.5 °C, we see that health has become a topic of concern for all of us. People are paying more attention to the health of the human-living Planet, the health of ecosystems, the health of cities, the health of societies and the health of individuals. Facing high-density urban environments and fast-paced lifestyles, people are looking forward to immersing themselves in nature to relieve their stress after their busy schedules. This indicates that the efficient operation of ecological infrastructure and the promotion of green lifestyles are crucial to maintaining a healthy urban living environment.

Throughout history, human societies have never ceased to serve their own healthy survival by creating landscapes. For example, humans made the continuous improvement of public health systems and implemented widespread urban park movements during industrialization. Nevertheless, the current outbreak of the pandemic has imposed a critical challenge to the global urban public health, while greatly affecting people's advocacy of green lifestyles and their attention to health promotion. In the meantime, the increasingly severe challenges of an aging society urgently require the construction of healthy and age-friendly environments. For children or adolescents, advances in modern technology and shifts in social life have reconstructed new life experiences; so it is necessary to provide them with more opportunities to contact the nature, so as to promote their healthy physical and mental growth and to foster their creativity, adventurousness and social interaction, among other competencies. Of course, other special groups also need more attention from us. For example, we need to provide places in cities for high-pressure people's physical and mental recovery, so that they can work and live in a healthier manner.

Undoubtedly, the landscapes shaped with urban green space are closely associated with humans' physical and mental health. Meanwhile, the traditional biomedical model is shifting to the "bio – psycho – social – environmental" multidimensional medical model, thus further driving the public to attach more importance to their living environment. The new holistic view of medicine focuses more on the integrated treatment model. Especially, a large number of patients with chronic diseases require such interventions as creating a good living environment and changing lifestyle habits to achieve better healing results. Over the past few decades, with gradually intensified research on the linkage between psychology and physiology, we have further understood that exposures to the natural landscape will deliver positive effects on human health. As demonstrated by many studies, a natural environment is conducive to calmer moods and lower blood pressures, as well as better work performance and problem-solving abilities. In

addition, those who live around green natural environments have better physical health and higher levels of well-being.

These studies highlight the significance of natural systems in cities. Landscape architects are required to consider the association between urban green space and people's dwelling, living, working and resting in terms of spatial patterns and green-space qualities, so that more living realms are infiltrated with green environments and more healthy landscape systems are constructed. Under the requirements of high-quality development, however, some pressing issues still exist with the health efficacy of urban green-space services. For instance, how to plan, design and manage our living environment, so that it can play an important health-promoting role while meeting the basic functional needs? What types of landscapes are most effective in promoting health? How to assess the landscape thresholds needed for promoting health? And what exposure pathways can effectively promote health? Although the evaluation of healthy landscapes and their effectiveness is still in an exploratory stage, the shaping of healthy landscapes and the play-out of their effectiveness entail acceleration of promoting evidence-based approaches, just as the development of medicine has entered the "evidence-based" stage.

"Park City" currently being advocated have made some explorations in creating a happy, healthy and comfortable green environment for the public. Many cities have already featured thousands of parks, making them a veritable city of parks. Some cities are gradually dismantling their park walls: Chaoyang District in Beijing plans to "remove the fences" of more than 50 urban parks; Shanghai has announced that some of its parks will be open 24 hours a day. Parks that have their gates opened would be better integrated with cities' functions and citizens' lives, providing more convenience for promoting people's leisure and health. The purpose of integrating green space into cities is to enable the ecological infrastructure to perform its ecological regulation function at the most effective level, so that such space would not only look beautiful, but also function well. For example, it can regulate rainstorms and runoffs across cities and diminish urban heat-island effects, so as to form a healthy urban ecosystem.

In the future, the urban population will keep growing, thus delivering more intense demands on land, housing, food, transportation and employment. This will undoubtedly further exacerbate a series of urban problems affecting health, such as environmental safety, mental stress and even disease. In this context, landscape architects are required to actively explore the relationship between landscape and health in multiple dimensions, and it becomes urgently necessary to seek for more possibilities of promoting health through landscape in the future.

Editor-in-Chief: Professor ZHENG Xi
January 7, 2023

KAMP D. Building Health: The Role of Nature and Design[J]. Landscape Architecture, 2023, 30(1): 20-29. DOI: 10.12409/j.fjyl.202207260437.

Building Health: The Role of Nature and Design

Author: (USA) David Kamp Translator: LIU Rui Proofreader: CHEN Chongxian

Abstract: [Objective] This paper seeks to put individual health on a continuum with environmental health. It presents an approach to sustainable development that emphasizes the individual perspective in promoting health, a strategy that helps create conditions for individuals to better cope with life's challenges, improve the quality of life and increase a sense of wellbeing and connectedness to nature. [Methods] Using case studies, the paper explores salutogenic design concepts that can help establish health-promoting resources for communities and address larger health inequalities. [Results] Salutogenic

concepts can be extrapolated to inform design choices, enhancing individual experiences and health-promoting outlooks within the framework of large-scale sustainable development initiatives. [Conclusion] A holistic design methodology incorporating salutogenesis, natural systems and technology with physical and social infrastructure can help create a healthy, vibrant, resilient, and equitable future.

Keywords: nature, design, and health; landscape design; salutogenic design; adaptive coastal infrastructure

It seems this is the best of times and the worst of times. Our capacity and potential and the technological and scientific resources we have at our disposal are unprecedented. Yet so are the threats to the basic health of the planet and its inhabitants. Biodiversity declines while greenhouse gas emissions increase as the Earth's climate grows more erratic. Vast portions of the world's fastest growing cities are built on ecologically sensitive, unstable landscapes that lack the natural support systems necessary to provide a basic quality of life for its inhabitants. It is time for collaborative and creative thinking (Fig. 1).

1 Regaining Balance

For centuries technology and science transformed our relationship with nature, an aspiration reflecting an ever-increasing swing toward minimizing its influence in our lives. Now, landscape architects, architects, and planners, supported by a powerful group of researchers and advocates, are leading a shift back toward a more engaged relationship with the natural world^[1]. Urban historian Sam Bass Warner calls it “recovering some human wisdom”^① while social ecologist Stephen Kellert says it is our birthright^[2-3]^②. E. O. Wilson described it as biophilia, the urge to affiliate with other forms of life^[4]. At its core is the fundamental link between nature, humans, and basic well-being.

The need for a connection to nature is never more poignant than in times of crisis, when stability and continuity are threatened, and our sense of vulnerability heightened. As we embrace a future of dramatic and complex change, we must maintain a concerted effort to balance our scientific and technological advancements with our intrinsic need for nature in a way that is genuine, intimate, and immediate. This effort demands we reflect on the historical and cultural underpinnings of the art and science of healing; crafting sensitive, adaptive, and holistic design responses; and practicing design as a social art, with dialog and collaboration. By putting human health on a continuum with environmental health, design can help individual choices coalesce into collective ones that lead to a more vibrant and equitable world (Fig. 2).

2 Expanding Concepts of Health and Design

Design practitioners have long advocated for sustainable and regenerative design strategies. Over the years, the principles behind these methodologies, balancing resource use and environmental preservation, have expanded to encompass a larger responsibility: to not only accommodate but improve the life of future generations by restoring and repairing natural systems and preventing future ecosystem damage. Complementing these concepts is the idea of

salutogenesis — motivating individuals to make choices that promote health.

Salutogenesis^[5] is a perspective of personal health proposed by sociologist Aaron Antonovsky, whose research concerned the relationship between stress, health, and well-being. His proposal, the Salutogenic Model of Health, a theory to guide health promotion, looks at the factors that promote health rather than factors that cause disease^[6]. At its core is his “Sense of Coherence” construct, which describes the role of stress in human functioning and the need to maintain an orientation towards the world that is comprehensible, manageable, and meaningful. In essence, a fortified sense of coherence — comprehending a situation, managing effective actions, and finding meaning or purpose — better prepares us for life's challenges. Antonovsky's hypothesis emphasizes the importance of helping an individual determine a quality of life and understanding how that quality influences their behavior and choices (Fig. 3).

As I have written elsewhere, one can argue that all design aims to be salutogenic^[7]. If not explicit then by implication, design is the art of rendering the designed environment comprehensible, manageable, and meaningful. Design is an expression of values, reflecting our hopes and aspirations in what we choose to build; and our quality of life is influenced by the quality of the designed relationship between the built and natural environments. But it has



1 Rockefeller Center Channel Gardens, New York, NY
2 Creating settings that improve health and well-being

3 Using design and nature to help define a quality of life

4 The Blue Climate Initiative: Transformational Opportunities

become difficult for designers to balance the myriad physical systems that need to be accommodated with the forces that influence our ability to manage natural, technical, economic, and human resources. The future of personal health may well depend upon this balance: each of us must not be hampered by the environment in finding meaning in our lives or else we will not care enough to find the strength to persevere. Trusting that Antonovsky's hypothesis has merit, it is essential for designers to emphasize a sense of coherence in the places we build, strengthening the threads that tie individual experiences to larger social and environmental needs.

3 Representative Case Studies

The following case studies represent projects that apply sustainable, regenerative, and salutogenic ideas to resolve complex problems, highlighting the interconnectedness of the built and natural worlds. They also emphasize design's ability to transcend scale, serving as an effective resource for inspired individuals, engaged communities, and global initiatives (Fig. 4).

3.1 The Blue Climate Initiative

The Blue Climate Initiative is a multiyear international program attempting to accelerate ocean-based strategies that combat climate change. Sponsored by the Tetiaroa Society, the initiative brings together pioneering practitioners, researchers, and leaders to leverage the power of our oceans to address some of the greatest challenges of our time: renewable energy, sustainable food supplies, clean drinking water, improved human health, flourishing biodiversity, and sustainable ocean economies^③.

In early 2021, as part of an endorsed program of the United Nations Decade of Ocean Science for Sustainable Development^⑧, the Blue Climate Initiative granted awards for innovative climate solutions to a variety of communities and organizations around the world. The initiative seeks to create a global web of resources, leveraging the dynamism and leadership of the world's coastal communities with international research and educational institutions, nonprofit organizations, and sustainable businesses to generate and share

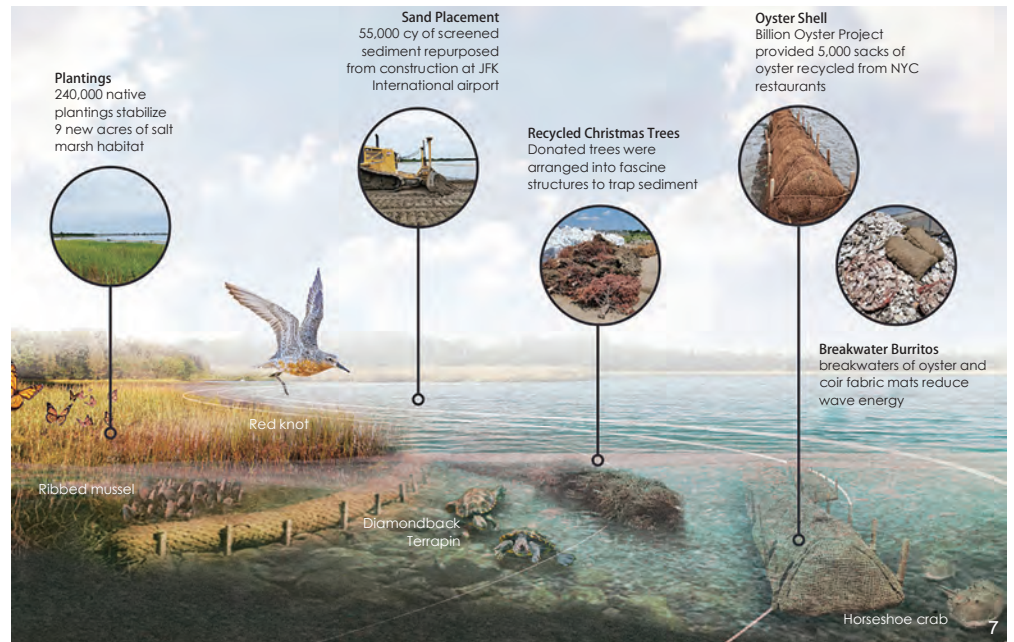
knowledge, advance new technologies and promote collaborative education and outreach efforts. The goal is to create a platform for extending and amplifying the work of individual communities, turning innovative local responses into realistic and transferable global solutions.

In preparation for this initiative, working groups were established to explore transformational opportunities. I was invited to join a group looking at human health and well-being. My collaborators came from across the globe — from Falmouth, Massachusetts, to Falmouth, Cornwall, from the Woods Hole Oceanographic Institution to the World Bank's Climate Change and Health Program. Asked to contribute my perspective on the built environment and its relationship to coastal environments, I framed a response around the idea of adaptive coastal infrastructure (Fig. 5)^④.

Developing an adaptive approach to coastal infrastructure intends to blur the boundaries of the built and marine environment practically and philosophically. It seeks to meld the physical environment (our communities and support



5 Adaptive coastal infrastructure: Concept image



6 West Pond Living Shoreline, Jamaica Bay Wildlife Refuge, New York, NY

7 West Pond Living Shoreline: Conceptual diagram

networks such as transportation and utilities) and economic systems (such as commerce and food production) with larger goals: environmental remediation and building economic, societal, and personal resiliency for individuals living in complex and often daunting circumstances. It ties together diverse but interrelated perspectives, such as engineering, biology, and economic investment.

Centuries of coastal settlement have resulted in a vast accretion of critical infrastructure in low lying and exposed areas. These expansive, aging networks undergird coastal communities around the world; many of these systems were not designed to withstand today's (or tomorrow's) environmental stresses. The age of climate crisis exposed myriad vulnerabilities of these networks to the twin threats of sea level rise and increasing storm severity and frequency.

Building resilient infrastructure does not mean building bigger or stronger. Resilience implies a nimbleness, responsiveness, a capacity to adapt to uncertain futures. At a time of increasing strain on limited resources, designers should promote a process that includes the creative retrofitting of existing infrastructure; one that strives towards

emergence and synergy — with other infrastructure networks, natural systems and habitats, sustainable commerce, and the unique needs of individual communities. Coastal infrastructure of the 21st century can no longer serve narrow purposes with linear, extractive flows of energy — they must embrace complexity, operate sustainably, and reflect a conception of the coast not as a fixed boundary but a continuous and migrating zone. Responsive infrastructure requires designers to embrace the complexity of communities, ensuring planning efforts are informed by the individuals these systems and networks touch — both in terms of identifying key issues but also in visioning possible futures and desired outcomes. Building health and resilience begins with empowerment (Fig. 6).

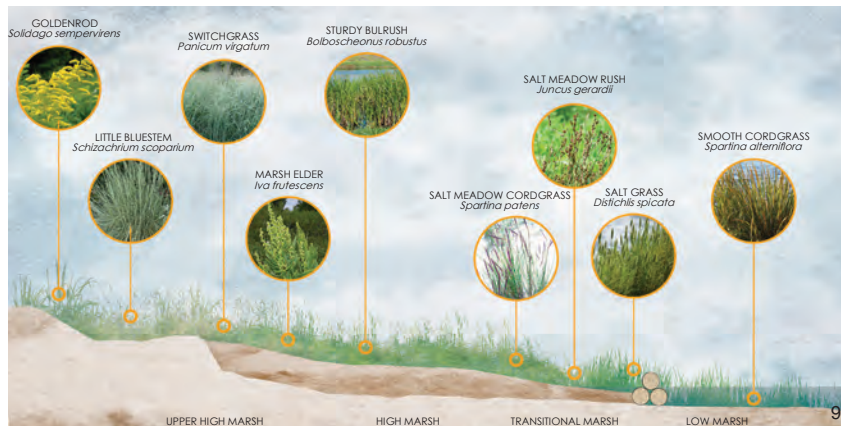
3.2 West Pond Living Shoreline

The West Pond Living Shoreline Restoration Project, in the Jamaica Bay Wildlife Refuge in Queens, New York^⑤, leverages the bay's dynamic systems to protect critical habitat and species while engaging the surrounding community with its restoration. Along vulnerable pond edges, a constellation of design strategies coalesce to

attenuate wave action, improve water quality, and support the reemergence of mudflats and saltmarsh. This living framework supports restoration of pond edges while adapting this vulnerable ecosystem to the many challenges presented by climate change.

Over the past century, New York City has lost over 90% of its freshwater wetlands. One of the most important remaining wetland areas is Jamaica Bay. West Pond, a critical freshwater lagoon within the larger Jamaica Bay ecosystem, is a resource of extraordinary cultural and ecological value. For generations, it has been a beloved community asset and vital freshwater source for migratory birds along the Atlantic Flyway.

In 2012, as the result of Hurricane Sandy, a narrow barrier was breached, mixing the pond's fresh water with the bay's saltwater. My firm, Dirtworks Landscape Architecture, PC was asked to develop a response, which considered the complex interplay of a shifting estuarine ecosystem alongside the National Park Service's programmatic and accessibility goals. Our goal was to leverage Jamaica Bay's dynamic natural systems to reestablish, protect and sustain West Pond's critical marsh habitat (Fig. 7-9).



- 8 Conceptual section. The living design will provide new wildlife habitation and layers of protection along this vulnerable shoreline
- 9 Marsh planting communities. The shoreline was planted with over 200,000 native grasses and shrubs, limiting erosion, and providing wildlife habitat
- 10 To create a new shoreline, repurposed cleaned fill was brought in from nearby construction sites
- 11 Oyster shells for our stabilization effort were collected through the Billion Oyster Project's shell collation program and placed in biodegradable bags by volunteers
- 12 The innovative "breakwater burrito" was created by packing oysters in burlap, stacking them in a pyramidal structure, and wrapping the structure in coir fabric

To ameliorate the damage as quickly as possible, time was of the essence. Leading a team of marine engineers, ecologists, community advocates and volunteers, within eighteen months we designed and implemented a 2,400-foot living shoreline, creating over nine acres of new habitat, and restoring fourteen acres. Along the formerly breached dam edge, a constellation of strategies — breakwater structures, additional sediment, marsh plantings and erosion control — coalesce to attenuate wave action, improve water quality, and support the reemergence of mudflats and saltmarsh. This living framework supports the immediate need to restore the pond edge while adapting this vulnerable ecosystem to the challenges of climate change (Fig. 10).

Our team studied a variety of possible

approaches, including naturally occurring rib mussel communities and spat-on-shell oyster reef construction. Due to the National Park Services' mandate against aquaculture, we determined that an oyster shell breakwater structure would be the most effective solution here. Nimble responses to supply chain and pandemic-related disruptions required close collaboration, flexibility, and creativity. It all came down to coconut fiber. With most coconut fiber coming from Sri Lanka, a global slowdown in shipping and production forced us to consider alternative materials. Partnering with the Billion Oyster Project®, we sourced recycled oyster shells from New York City restaurants, cured them in the sun for twelve months, and then packed them in locally sourced burlap bags. Because burlap breaks down faster in high salt conditions, we developed

an innovative "breakwater burrito" by packing the burlap bags, stacking them in a pyramidal structure, and then wrapping the entire twelve-foot-long assembly with coir fabric. These breakwater structures, together with recycled Christmas tree fascines, attenuate wave action, accrete sediment, and protect the newly constructed shoreline (Fig. 11-12).

Building upon the principles of salutogenic design, community engagement was essential for the project's success. Our work included coordinating the collaborative efforts of local environmental advocacy groups and nonprofits and overseeing the work of hundreds of volunteers. Existing habitat and native populations needed protection during construction, which included establishing a program of daily monitoring for protected species. Silt sock barriers were installed



for six hundred eighty breeding terrapin females and construction crews were trained to check for terrapins who might take a midday nap in the shade under construction equipment.

To accommodate the project's concentrated timeframe key design strategies, such as plant selections, were quickly determined because local nurseries needed to begin growing the specified plugs for our 240,000 native plantings a year in advance. Plantings were installed in salt marsh and intertidal zones, creating a resilient ecotone between the high marsh and freshwater pond (Fig. 13-14).

Our client's goal to monitor the long-term health of the project included a two-year contract with the Jamaica Bay Science and Resilience Institute. Data-driven research will sustain and inform this living shoreline design while also tracking the health of the neighboring maritime forest, shrubland, mudflat, and lacustrine freshwater herbaceous wetlands (Fig. 15).

Protecting and sustaining West Pond is critical to the resiliency of the larger Gateway National Park ecosystem. Equally critical is protecting and sustaining the idea of community stewardship. This multi-discipline, community-based initiative establishes an effective and vital response to our changing climate (Fig. 16).

4 Optimizing Strategies

Building responsive infrastructure deals not only with climate change but also with optimizing public health for future crises. The COVID-19 pandemic is a humbling reminder of the work that is yet to be done to improve the health and well-being of everyone. How do we create resilient and supportive health structures within our communities? Salutogenetic design allows us to reconsider the planning of our communities to better equip people with the resources to adapt and make informed choices. Working collaboratively with professionals in diverse fields, such as economics, social and environmental science, designers can better understand the factors shaping these choices and their influence on our communities and the environment we share. A holistic design methodology incorporating salutogenesis, natural systems and technology, in combination with adaptive physical and social infrastructure, can help create a vibrant, resilient, and equitable future.

Notes:

- ① The Warner quote is from his unpublished paper "Restorative Gardens: Recovering Some Human Wisdom for Modern Design."
- ② Stephen R. Kellert, a professor of social ecology at Yale, published many books incorporating the concept of

- 13 To support a resilient coastal condition, plantings were installed in salt marsh and intertidal zones
- 14 Building upon the principles of salutogenic design, community engagement was essential for the project's success
- 15 Data-driven research will sustain and inform this living shoreline design while tracking the health of the neighboring ecosystems
- 16 The project successfully created nine new acres of tidal wetland and restored over fourteen acres of wildlife habitat

biophilia, including reference [2][3].

③ The Tetiaroa Society is a nonprofit focused on the conservation of Tetiaroa, an atoll in French Polynesia, and the well-being of the oceans. The organization was founded by the Marlon Brando Estate, owners of the island and its luxury resort hotel, The Brando. See <https://www.tetiaroasociety.org/>.

④ The concept is from David Kamp's 2018 unpublished paper "Adaptive Coastal Infrastructure."

⑤ The Jamaica Bay Wildlife Refuge is part of the 27,000-acre Gateway National Recreation Area.

⑥ The Billion Oyster Project is a New York City-based nonprofit organization working in collaboration with local communities to restore one billion live oysters to New York Harbor by 2035. Oyster reefs provide habitat for hundreds of species and can protect urban areas from storm damage by softening the blow of large waves, reducing flooding, and preventing erosion along the shorelines.

Sources of Figures:

Fig. 1-3, 16 photo by Dirtworks, PC; Fig. 4: courtesy of Tetiaroa Society, Blue Climate Initiative; Fig. 5, 7-9: courtesy of Dirtworks, PC; Fig. 6, 13, 15 photo by Jean Schwarzwald/DEP; Fig. 10 photo by Dan Mundy, Jr.; Fig. 11-12, 14 photo by Alex Zablocki.

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