Health and the Environment: Shaping Policy and Place through Community Academic Partnerships

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Figure 1: Three nested watersheds, Paradise Creek Nature Park plan, and views of educational pavilions

ABSTRACT: Innovative pedagogical models in architectural education can educate practitioners, policymakers, and the public about the crucial relationship between public health and the built environment. This paper describes an interdisciplinary design research methodology that works with community partners to identify opportunities, design sustainable projects that inspire environmental stewardship, and develop implementation strategies. Civic engagement to influence public policy is an essential aspect of this approach to academic research. In collaboration with the City of Portsmouth, non-profit environmental groups, Portsmouth public schools and community partners, University of Virginia faculty and students from architecture, art and medicine investigated the complex relationship between human health, environmental restoration, and sustainability education through the design of a forty-acre wetland park. The Paradise Creek Nature Park will co-exist with contaminated industrial sites and an economically challenged and racially diverse neighborhood. Students designed the Park and its Wetland Learning Lab and Rainwater Filtration Pavilion to engage urban kids in hands-on learning. There were several research goals: create a place that increases the sense of well-being, economic vitality and opportunity for outdoor exploration for all ages; design green pavilions that educate visitors about sustainability; make a place where citizens may rediscover the healing respite of a healthy river; and create strategies for industry and natural ecosystem to co-exist in harmony. The research considered complex social, economic, ecological and architectural issues across scales. The design manifests an inventive educational agenda that teaches about sustainable dwelling, environmental restoration and human health. This design research project establishes a model for university and community collaboration that is capable of changing public policies, while fostering a commitment to environmental ethics and sustainable practices by connecting academic learning with the students' desire to make a positive difference in the world.

KEYWORDS: public park, health, community partnerships, restoration, education

INTRODUCTION

A civically engaged design process that influences public policy is central to this academic research. In collaboration with the City of Portsmouth, Portsmouth Public Schools, the Elizabeth River Project (ERP) and other community partners, University of Virginia (UVA) faculty and students investigated the complex relationship between human health, environmental restoration, and sustainability education through the design of a forty-acre public wetland park. The Paradise Creek Nature Park research project provides the opportunity to assist a community in need, while designing, implementing and testing strategies for creating healthy places and shaping public policy in the community. The Hampton Roads region and immediate park vicinity possess a challenging mix of conditions, including industrial, economic, emotional and spiritual stresses that contribute to environmental degradation, gang violence and other ills. The investigation raises several questions: How might a particular design encourage individual and community reflection, spiritual connection and environmental stewardship? Can the design physically manifest an educational agenda that teaches about sustainable dwelling at several scales? Does experiencing a restored urban nature park amidst industry affect the visitor's well-being and resilience?

1.0 RESEARCH OBJECTIVES AND METHODOLOGY

1.1 Methodology

This study utilizes a design research methodology that generates architectural knowledge through the design process, physical realization of the project, critical reflection, and dissemination. Several related theoretical frameworks support this methodology, including Donald Schön's concept of the *reflective practitioner,* Brad Haseman's *performative research* paradigm, Nigel Cross' *designerly way of knowing,* Alain Findeli's *project-grounded research,* and the *design fiction* approach of Simon Grand and Martin Wiedmer. (Schön 1983; Haseman 2006; Cross 2007, 2011; Findeli 2008; Grand and Wiedmer, 2010) Wolfgang Jonas' essay, "Exploring the Swampy Ground: An Inquiry into the Logic of Design Research," effectively argues for the validity of design research supported by theories from the 1960's to the present. (Grand 2012) In the Journal of Architectural Education's theme issue, *Architectural Design as Research, Scholarship, and Inquiry,* my essay "Working on the Elizabeth River" advanced the design research method that is utilized in the Paradise Creek Nature Park study. (Crisman 2007) This paradigm rejects the simplistic and non-productive framing of a duality between qualitative and quantitative research.

1.2 Phased Research Goals and Objectives

This research is part of a multi-year study starting in 2006 that involves several studios and implemented projects. The overall goal is to establish a model for university and community collaboration that is capable of changing public policies about the value of environmental restoration and sustainability education. Connecting academic learning with the students' desire to make a positive difference in the world fosters a commitment to environmental ethics and sustainable practices. The first goal of the Paradise Creek Nature Park research is to create a public place that increases the sense of well-being, economic vitality and opportunity for outdoor exploration for all ages. Several objectives were established for the ongoing research that will extend through construction completion. These objectives include completing a literature review of environmental and evolutionary psychology research that studies the measurable impacts of nature and public parks in urban settings on user health and well-being; structuring a design research process to maximize the potential for the built Park to increase human health and well-being; designing green pavilions, a children's playground and other places that educate visitors about sustainability by revealing the relationship between natural and built systems;[1] creating strategies for industry and natural ecosystem to co-exist in harmony; and constructing a public place where citizens may rediscover the healing respite of a healthy, living river. When Park construction is completed in 2015, the research team will focus on the second goal of understanding how urban environmental restoration through the creation of public parks contributes to improved human health and well-being. This will be achieved by completing a post-occupancy analysis that surveys park visitors and by publishing evidence-based best practices for the creation of public parks in industrialized urban settings. The third goal is to create a powerful model for how university researchers may collaborate with diverse community partners to effectively create green spaces that can change public policy about the value of the environment to human health and well-being.

Figure 2: Rainwater Filtration Pavilion at Park entrance

2.0 HUMAN HEALTH AND THE ENVIRONMENT

Currently the public health sector is intensely interested in how both *natural* and *synthetic* environments affect human health and well-being. A growing body of research attempts to measure and compare the benefits of short-term human activity in these two types of places. Use of the term *natural* in these studies is misguided, since it suggests these places are not the result of human design. In fact, a park and a college campus are designed artifacts. All of these *natural* environments have been constructed through human agency. Those reservations aside, this quantitative research can support the claim of designers for the significance of the built environment and perhaps more effectively shape policy by appealing to the quantitative bias of politicians. A recent review of twenty-five such studies concluded that "natural environments may have direct and positive impacts on well-being," yet the authors acknowledged the difficulty of this place-based research outside the lab.

> Cross-sectional studies have suggested positive relationships between green space and health; however, identifying the causal pathway can be complex. In order to objectively assess whether or not there is an 'added benefit' from green space, research studies need to investigate if there is a difference in the health benefits of an activity in a natural environment (e.g. a park) compared with the same activity in a more synthetic environment (e.g. a gym). If it is found that the natural environment does bring added benefits to health and well-being over and above those arising from the activity being undertaken, it is important to understand what benefits are realised, by whom, and in which environments. (Bowler 2010)

Environmental Psychology Professors Rachel and Stephen Kaplan's 1989 book, *The Experience of Nature: A Psychological Perspective*, developed the Attention Restoration Theory that humans concentrate more effectively after spending time in nature. (Kaplan 1989) In a later paper, *The Restorative Benefits of Nature: Toward an Integrative Framework,* goes further to state: "Natural environments turn out to be particularly rich in the characteristics necessary for restorative experiences." (Kaplan 1995) Of course, there are many types of natural spaces and those located within cities must be understood in relation to the surrounding physical context. Studies such as *Green Space, Urbanity, and Health: How Strong is the Relation?* examine how the health of different socioeconomic groups is affected by parks and other green spaces specifically located within urban environments.

> "The percentage of green space inside a one kilometre and a three kilometre radius had a significant relation to perceived general health. The relation was generally present at all degrees of urbanity. The overall relation is somewhat stronger for lower socioeconomic groups. Elderly, youth, and secondary educated people in large cities seem to benefit more from presence of green areas in their living environment than other groups in large cities. This research shows that the percentage of green space in

> people's living environment has a positive association with the perceived general health of residents. Green space seems to be more than just a luxury and consequently the development of green space should be allocated a more central position in spatial planning policy." (Maas 2006)

Based on these findings, the immediate population served by the Paradise Creek Nature Park may experience greater benefits. Also underlying this design research is the *Biophilia Hypothesis* that an instinctive or evolutionary biological bond exists between humans and other living things. (Wilson 1984) Related theories of evolutionary psychology support the human need and often preference for natural settings, trees, animals and the like. While valuing both evolutionary and environmental psychology studies linking human well-being to spending time in natural environments, this design research does not seek to quantitatively measure such outcomes in the Park. Just as important as these social science studies, however, is the scholarly research that investigates the relationship between ethics and aesthetics in place design. Several essays in *The Hand and the Soul: Essays on Aesthetics and Ethics in Architecture and Art* connect issues of beauty, form and sensory pleasure with ethical obligations to the human community and natural world. (Iliescu 2009) Though the subject of another paper, but it is important to note that qualitative aspects that are undervalued in psychological or medical research that relies solely on the scientific method.

3.0 PARADISE CREEK NATURE PARK

3.1 Overview

The Paradise Creek Nature Park is located along a tributary of the Elizabeth River in Southeastern Virginia. One of the most industrialized and polluted tributaries of the Chesapeake Bay, the river is also known as Norfolk harbor and supports the world's largest naval base. There is limited public waterfront access and area residents are largely disconnected from the river at the physical and psychological levels. The site offers challenging constraints and rich opportunities. A mature forest coexists with dredge spoils, invasive plant species, toxic industrial sites and an economically challenged urban neighborhood. In this area of exquisite beauty and horrific environmental degradation, citizen-led efforts are making wildlife meadows and rain gardens, storm water improvements, back yard habitats and a constructed oyster reef. The US Navy has converted seventy acres of waste landfill into wildlife habitat across the creek. In collaboration with residents, environmentalists and nearby industries, UVA's cross-disciplinary team has created a design that invites visitors into a deeper relationship with their community and River. The Park will be the first public landscape in the region with the primary purpose of engaging 20,000 citizens a year in environmental stewardship of the Chesapeake Bay by providing public river access and conservation education.

Figure 3: Children's Playground

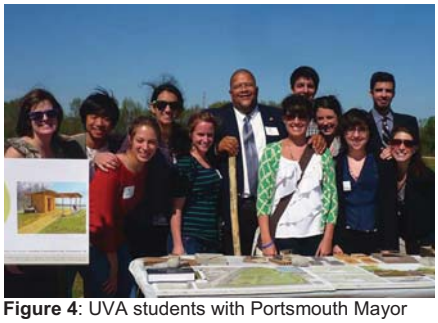

Figure 4: UVA students with Portsmouth Mayor

3.2 Community Engagement and Research Partners

The Elizabeth River Project, lead NGO partner, worked with the community on more than twenty projects to restore the Paradise Creek tributary. When a stakeholder committee identified the need for public park access to inspire long-term river stewardship, ERP purchased the forty-acre park site and met over a two-year period with nearly fifty diverse stakeholders to develop consensus on a park plan. UVA research involvement began at that point in 2006 and in 2012 we completed design of the Phase II park plan and several architectural elements that will engage urban kids in hands-on learning. Specific outreach methods are currently being used to connect with key stakeholders and build public support. For instance, twenty at-risk youth have become *Park Ambassadors.* They are growing native plants, removing invasive species, educating the community, providing input on the UVA park design, and will eventually help UVA students to build the park pavilions. Multifaceted community engagement is a crucial aspect of the research approach. The research team includes UVA faculty and students from several disciplines and multiple external partners, including Portsmouth Public School science teachers, Portsmouth city officials and Cradock Neighborhood Association members. Several state and federal agencies are involved as well: the National

Oceanic and Atmospheric Administration and Virginia Departments of Environmental Quality, Forestry, Conservation & Recreation, and Game & Inland Fisheries. The US Environmental Protection Agency provided habitat recommendations and project funding. Paradise Creek Nature Park is one of only five urban sites selected by the federal government to participate in the *America's Great Outdoors* partnership. This diverse array of partners is working together to restore living resources, conserve land, increase public access, and expand citizen stewardship of the Park and ultimately the Chesapeake Bay.

3.3 Park Visitors and their Needs

Paradise Creek Nature Park will meet the needs of diverse stakeholders in one of the most populated regions of Virginia. The Park is predicted to attract over 20,000 park visitors a year from the Hampton Roads metropolitan area, whose population totals 1.7 million and includes the cities of Norfolk, Portsmouth, Chesapeake and Virginia Beach. Audiences include inner-city students, at-risk youth, and families lacking access to meaningful outdoor experiences and missing out on the well-being that comes with green space. Foremost, the park will connect residents with their home river at the physical and psychological levels. This reconnection to the Elizabeth as a living river is essential to sustain public support for environmental restoration. Surrounded on three sides by heavy industry, the Park has the potential to become a place of reconciliation between industry and environment. Already neighboring industries have participated in wildlife habitat and pollution reduction projects. Finally, the Park will increase green space in the distressed and aging port city. Portsmouth, the poorest of four cities in the Elizabeth River watershed, has only a third of the park space that is recommended for its size.

3.4 Design Research Studio Pedagogy

The studio pedagogy is structured around scholarship on community engagement (Boyer 1996; Wood 2003) and theories of agency.[2] (Giddens 1984; Latour 1987; Schneider and Till 2009) During a Spring 2012 design research studio, undergraduate architecture students completed a multi-faceted investigation. They created case studies of innovative nature parks and outdoor classrooms, studied environmental education programs, and researched the water, wetland and wildlife habitat ecosystems and human culture and settlement history of the park site. After completing a detailed site analysis, they designed a Phase II Park plan, two pavilions for classroom activities and social gatherings, green play areas and canoe launch to promote physical activity, and benches and moveable furniture for individual reflection and relaxation. Throughout the process the UVA students worked closely with ERP and teachers from Portsmouth Public Schools and Starbase Victory—a hands-on science enrichment program focused on science, technology, engineering and math skills for middle-school students. Ultimately, the studio pedagogy was structured to teach students create designs that enrich the physical and mental wellbeing of individuals and the larger community. Numerous sustainable strategies based on *SITES Guidelines and Performance Benchmarks,* such as easy orientation, accessibility, safety and showing signs of human care, were employed to create places for mental restoration, social interaction and physical activity**.** Educational and interactive elements, including paths, portals and pavilions, were designed to welcome people into the park and teach them about its history and culture. The park was designed for greater environmental awareness by creating restorative natural views of the river using visual and sound screening to focus inhabitants. (Stoner 2008) The restored and healthy ecosystem of Paradise Creek Nature Park may be the source of many real and measurable benefits that humans derive from a relationship with nature.

CONCLUSION

The primary indicator of success will be an increased sense of well-being and health for Paradise Creek Nature Park visitors and nearby residents. Several planned outcomes will contribute to this overall goal. Exhibits will be visitor-centered, inquiry-based, and promote engagement. Utilizes the elements of portal, path, destination and sense of surround, the overall design will educate park visitors about the importance of green infrastructure, the value of riparian buffer conservation, native plants, tidal wetlands, and the role of the citizen steward. The Elizabeth River Project will provide guided Park tours and public education workshops, as well as evaluate public engagement based on numbers of visitors to the park. They will also monitor and measure green infrastructure performance by calculating nutrient reductions using the Virginia Stormwater Management Nutrient Design System. UVA will disseminate research through publications and exhibitions. In these ways, the project intends to become a national model for how a public park may promote health and well-being in the midst of industrial uses and a stressed urban community.

The research has particular pedagogical outcomes as well. By working with diverse community partners and real world constraints, the project empowered University students to enrich and focus their research, design and communication skills, while learning about intertwined issues of human health and sustainable design, environmental education, and community engagement. The students connected sustainability education with their lives as citizens making a positive difference in the world. Their work will contribute to the city of

Portsmouth and the entire Hampton Roads region—establishing a translatable model for sustainable land use, while creating a public place that physically and spiritually connects the urban community of the Elizabeth River watershed with its home river.

Figure 5: Wetland Learning Lab

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ENDNOTES

[1] For instance, the Water Filtration Pavilion collects and filters rainwater, a native plant rain garden filters gray water, solar panels supply required electricity, natural ventilation cools the structure, and recycled industrial materials are used in the building construction. The Park and its architecture physically manifest an inventive educational agenda that teaches about sustainable dwelling and human health, as well as the inextricable links between water and land, the tidal river ecology and wetland restoration.

[2] [Agency] means being able to intervene in the world, or to refrain from such intervention, with the effect of influencing a specific process or state of affairs. This presumes that to be an agent is to be able to deploy a range of causal powers, including that of influencing those deployed by others. Action depends on the capability of the individual to “make a difference” to a pre-existing state of affairs or course of events. An agent ceases to be such if he or she loses the capability to “make a difference”, that is to exercise some sort of power.” (Giddens 1984, 14)