



Blue Cities for Better Health

By Jenny Roe

*“The sea, once it casts its spell, holds one in its net of wonder forever”
- Jacques Yves Cousteau*

These words, penned by the French conservationist Jacques Cousteau, articulate what we all intuitively feel about moving water – be it the sea, a river, or a downtown fountain – and the unique magic and wonder it harbors. Recall when you were a child: running through fountains, the irresistible urge to dip your feet in a pool, or the thrill of diving into the ocean.

This inherent fascination and curiosity in water, in turn, triggers a host of well-being benefits, including a change in our mind-body interactions. Taking a walk along a downtown riverfront,

for example, can improve how we manage stress. Even [viewing images of the sea in a virtual reality environment](#) can reduce the pain we experience at the dentist.

In this article, I address why water settings have this positive effect on us, citing research from around the world. I argue that access to water in our cities is not just a “necessity of life” for basic human survival, for example, providing safe drinking water and sanitation, but is integral to sustaining our psychological well-being.

A Blue Model of Health

The notion that a dose of nature is good for our health is not new or novel. There is now a wealth of evidence to show that access to nature in our cities provides multiple benefits, from improving life longevity to alleviating depression. The [World Health Organization’s 2016](#) review of the evidence currently offers the most rigorous overview of the benefits of urban green space to physical, mental and social well-being. Collectively this is referred to as “green health.”

In recent years, researchers have begun pursuing the evidence in relation to “blue health” – the positive health benefits of access to our coasts, rivers and canals – led by several European research groups. By “blue,” I mean any environment that fosters interactions with water: from walking along a canal towpath, interacting with the sparkle and flow of a city water fountain, or even through virtual reality in a hospital or care home.

The evidence for blue health has recently been brought together in a systematic review by [Gascon et al. \(2017\)](#) with limited evidence showing the benefits of blue environments to physical health and psychological well-being. I’ll take a look at this evidence below, but first I explore the theory behind blue health.

What Triggers Blue Health?

There are four main pathways through which it is believed that nature contact (including blue environments) supports health ([Hartig et al. \(2014\)](#)). Two of these pathways are direct, meaning nature has a direct impact on our health without us consciously being aware of it. In

the case of blue environments, one direct pathway is temperature regulation, for example, water bodies help mitigate urban heat island effects. A second direct pathway is stress regulation with evidence to show that contact with nature slows down our stress response and induces calm.

The other two pathways in the model are physical activity and social contact. These pathways indicate that we are more active in environments where there is access to water and more likely to meet people in these environments, either incidentally or for organized activities. In these two scenarios, there is purposeful, direct interaction with the blue environment: we consciously choose to engage with the setting.

Another complementary, but distinctive theory, posits that our response to the blue environment is primarily a cognitive one, and that the soft stimuli of water – the patterns and light falling on it as it flows – promote our involuntary attention and recovery from cognitive fatigue. Called Attention Restoration Theory (ART)

(Kaplan and Kaplan (1989)), it argues that “fascination” in the natural environment - in this context, the curiosity and wonder that water sparks – is a critical environmental cue in the process of psychological restoration.

The Health Benefits of Blue Space:

Blue Space Makes Us More Physically Active

We are more likely to be physically active if we live near inland water or the coast. Blue features – such as fountains – simply make walking about a city a happier and more enjoyable experience. Sheffield, in the UK, is one city where urban designers and engineers have worked to integrate blue features into the urban fabric. The water theme is announced at the city’s major arrival point, the train station, that features a linear water feature screening the sound of the adjacent traffic, making the arrival experience welcoming and memorable.



Water, water everywhere ... in Sheffield, UK .
Photo Credit: Jenny Roe



Photo Credit: Jan Woudstra, University of Sheffield

There are a handful of studies showing that living near inland water increases one's likelihood to walk or run (see [Gascon et al. \(2017\)](#) for a full review). The most powerful evidence, however, comes from research in coastal settings. Studies from the UK ([Wood et al. \(2016\)](#)) and New Zealand ([Witten et al. \(2008\)](#)) have found a link between living near the coast and a lower Body Mass Index in children, and adolescents and adults. Several studies from Croatia have observed reduced hypertension among adult coronary heart disease patients in hospitals located in coastal areas ([Bergovec et al. \(2008\)](#)) as well as a higher prevalence of cardiovascular health problems among those living inland compared to those living near coasts, particularly in women ([Kern et al. \(2009\)](#)).

While the evidence is very limited currently, it does suggest that access to water improves the chances of being physically active, and potentially reduces the risk of obesity and associated chronic health problems, such as diabetes.

Blue Space and Psychological Well-Being

Access to blue space can reduce our stress levels and improve our psychological well-being. [Our](#)

[study](#) carried out in West Palm Beach, Florida, has shown how a short walk along a downtown waterfront can improve perceived and physiological stress as measured by heart rate variability and self-reports.

Furthermore, a tactical urban intervention along the waterfront significantly improved self-reported well-being, by directly engaging participants with the blue environment (via historical imagery of the sea) and improving the waterfront's comfort level by offering shade and seating. In this unique experiment, we showed how encouraging fascination in the blue environment can further enhance its effect on visitors' well-being.

Further evidence is provided by a handful of studies showing the effects – mostly of coastal settings – on psychological well-being (see again [Gascon et al. \(2017\)](#) for a review). Individuals report being happier in marine and coastal areas, as well as freshwater, wetlands and floodplains, compared with urban or rural settings ([MacKerron and Mourato \(2013\)](#)) (UK). Living nearer coastal areas has been shown to bring multiple benefits: better mental well-being ([Alcock et al. \(2015\)](#)) (UK); improved life satisfaction ([Brereton et al. \(2008\)](#)) (Ireland); and reduced psychological

distress in adults and adolescents, simply from increased views of blue space (ocean and freshwater) ([Nutsford et al. \(2016\)](#)) (NZ). The benefits of blue space are sustained across the life course: for children ([Amoly et al. \(2014\)](#)) (Spain), adolescents ([Huynh et al. \(2013\)](#)) and seniors ([Finlay et al. \(2015\)](#)). Older adults, in particular, have distinctly therapeutic relationships with blue space, providing opportunities to connect with the past as well as assisting with independent living in the present ([Coleman and Kerns \(2014\)](#)).

Access to Blue Spaces Makes Us More Sociable?

Only a handful of studies to date have found relationships between access to water and improved social well-being (for example, see [Triguero-Mas et al. \(2015\)](#)). Our study in West Palm Beach found significant positive change for social well-being indicators (including social trust and sense of belonging) from walking along a downtown waterfront designed with short-term seating, shade and interaction opportunities, compared to an exposed and empty section of the waterfront. Although the evidence is currently limited, access to canals and waterways arguably afford significant opportunities for social connections, including:

impromptu activities, for example walking the dog; organized activities such as canoeing or rowing; or purposely designed activities with environmental cues that trigger engagement.

Blue Environments for All

As yet, we don't have a full understanding of the impact of blue environments on our health and well-being but what we do know – outlined above – suggests great potential for blue space as a health resource. The fountains and waterways in our cities are not only practical and aesthetically pleasing, but are a human necessity that sustains our health and well-being. If blue space is to be employed as a really useful health tool, it needs to offer a quality environment that is accessible and safe for all. As Sheffield demonstrates, managing urban water systems with an integrated and sustainable urban water planning system, makes for a joyful and health promoting place that leaves a long-lasting sense of wonder.

Resources

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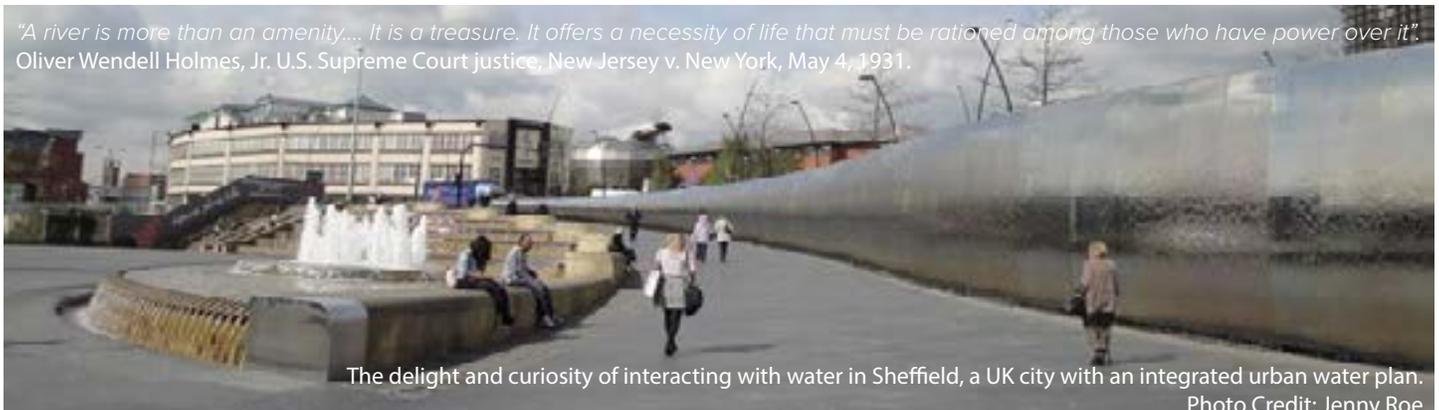
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"A river is more than an amenity.... It is a treasure. It offers a necessity of life that must be rationed among those who have power over it."
Oliver Wendell Holmes, Jr. U.S. Supreme Court justice, *New Jersey v. New York*, May 4, 1931.



The delight and curiosity of interacting with water in Sheffield, a UK city with an integrated urban water plan.
Photo Credit: Jenny Roe