BlueHealth
Linking environment, climate & health

The BlueHealth Toolbox

Guidance for urban planners and designers

Contents

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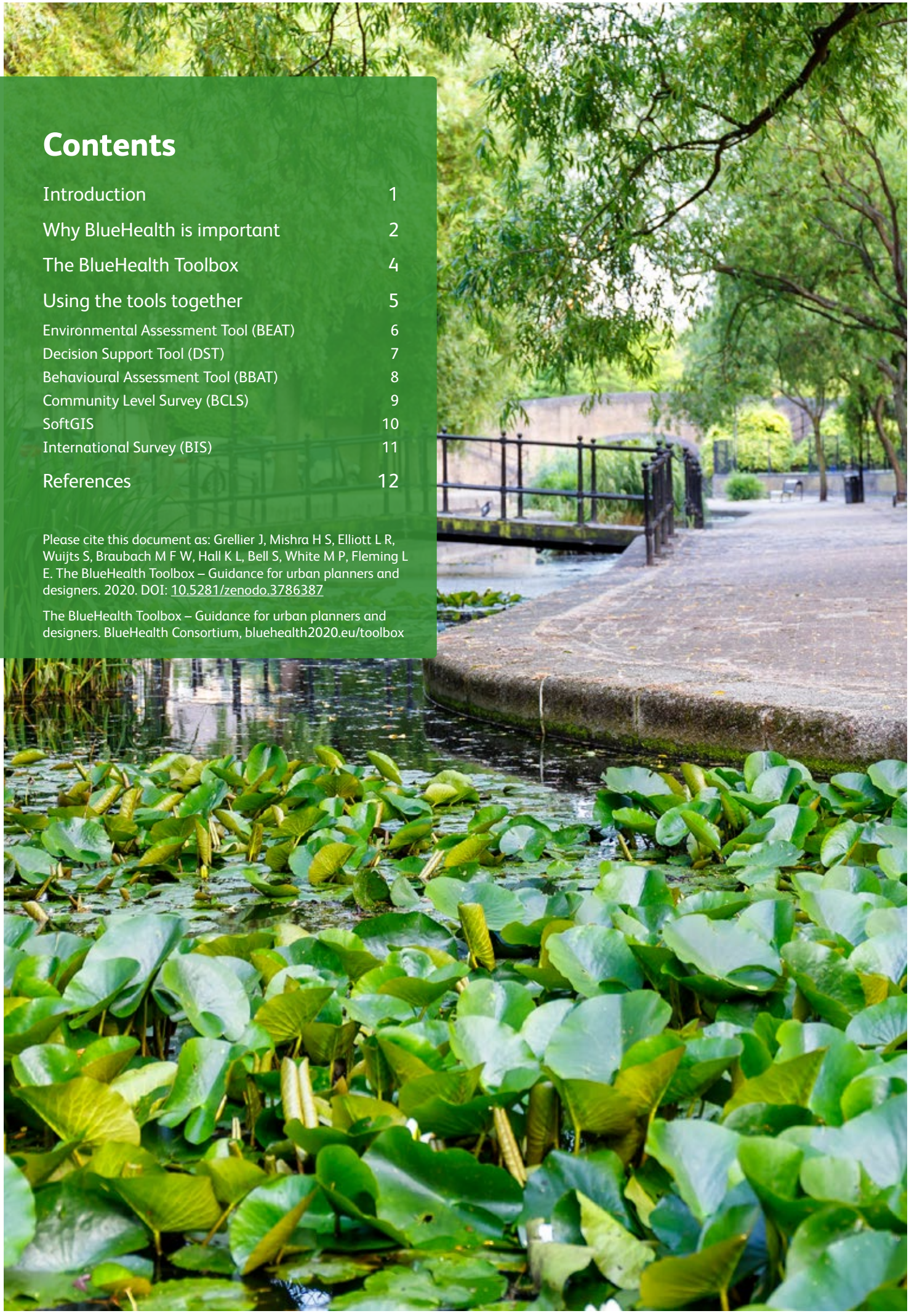
The BlueHealth Toolbox – Guidance for urban planners and designers. BlueHealth Consortium, bluehealth2020.eu/toolbox



Introduction

The BlueHealth Toolbox is for planners, designers and other decision-makers responsible for blue spaces. The tools provide the means to make comparable assessments of urban blue spaces before and after any proposed changes. Such changes can include a wide range of interventions, from physical alterations to the environment to advertising campaigns that influence how people interact with it. The tools provide evidence about the quality of blue environments, as well as information about how people and communities use, perceive and interact with blue spaces. They also assess the state of people's health and wellbeing. Together, this evidence can enhance urban planning and design.

Access to quality blue spaces is increasingly recognised as a way to benefit people's health and wellbeing.

The BlueHealth Toolbox provides the means to incorporate robust evidence into planning and design, as well as wider decision making.

The BlueHealth Toolbox comprises six tools that work at different spatial scales to collect social and environmental data on blue spaces.

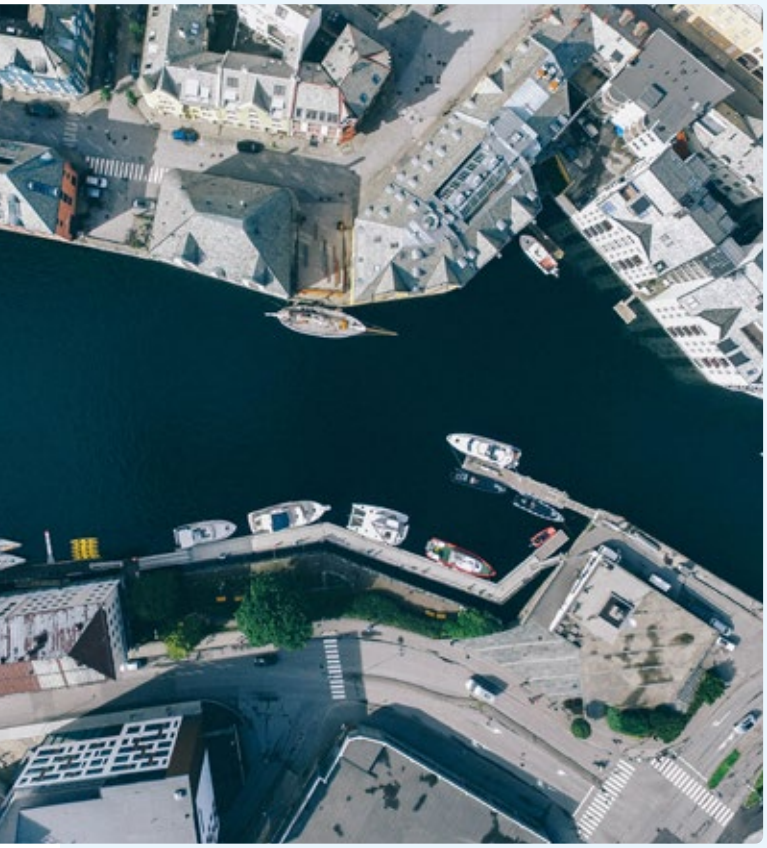
The tools can reveal elements of existing blue spaces that improve health with minimal cost to the environment, and so inform future management.

Why BlueHealth is important

Today over 200 million Europeans live in cities established on coastlines, along river networks, or on the shores of lakes.

Where natural 'blue' features are not present, fountains, canals, ponds or other water features may be constructed to generate blue spaces within the urban fabric. These blue spaces – and the blue infrastructure within them – play a major role in determining the quality of our urban areas and contribute a wide range of services and benefits for urban populations[1].

Exposure to blue space can promote health and wellbeing and prevent disease. Evidence suggests that people who live near – or have views of – water are generally healthier[2,3], experience fewer symptoms of mental distress[4,5] and are more satisfied with their lives[6–8] than those who don't. The positive effects of living near the coast, for instance, seem particularly pronounced for those with the highest levels of socioeconomic deprivation[2], suggesting that there is less health inequality, and fairer access to good quality environments, in such locations.



Several pathways may account for the positive relationship between health and exposure to blue space:

People feel happier[7,9] and less stressed[10] in blue space settings than in other outdoor locations[11].

Those living near blue spaces spend more time within them than those living further away[12] and coastal inhabitants are more likely to meet national guidelines for physical activity than those inland[13].

Blue spaces are seen as particularly important places to participate in positive social interactions with friends and family[14], and are more widely used for health and wellbeing purposes than green spaces[15].

Water bodies can contribute to mitigating the urban heat island effect[16], which is especially important in urban areas as average summer temperatures rise and heat-related morbidity and mortality increase[17].

As urban green spaces are increasingly encroached upon by construction[18] and as populations near large water bodies increase in size, urban blue spaces may become increasingly important sites for recreation and other activities. Incorporating evidence on the health-promoting effects of exposure to blue spaces into urban planning could help tackle public health challenges[19]. These include reducing the incidence of diseases associated with stress and sedentary lifestyles (e.g. heart disease, type 2 diabetes, cancer, etc.), and reducing morbidity and mortality related to increasing temperatures[20–22].

Why use evidence-based design?

Urban planners and landscape architects continuously seek relevant and up-to-date professional knowledge to meet the demands and brief of a project. Planners and designers frequently look at similar completed projects as precedents and constantly interact with decision-makers and community members to inform their approach. Public health practitioners and policy makers may seek to boost population health through various interventions, such as changes made to the urban fabric, or strategies designed to encourage physical activity or relaxation in natural spaces.

Gathering, evaluating and applying existing knowledge from elsewhere is a well-established practice in urban planning, as it is a relatively low-cost approach. However, there is often little connection between the success of the case studies used and the success of the projects that draw on them for reference.

An evidence-based approach to design supports sustainable development and achieve the aims of a project in the face of growing public health issues, increasing pressure on health-promoting urban nature, and growing social and ecological constraints. In particular, evidence-based approaches can help inform:

Designers

by enabling them to better understand a site and the needs of local communities. Evidence-based approaches can also help designers respond to demands imposed by clients, project briefs and planning agencies by proposing solutions with a higher likelihood of success.

Planners and policy makers

by providing a robust rationale for arguing why a particular policy or planning approach should be implemented, when faced with competing demands and pressures on public space.

Providing evidence for planning and designing blue spaces

Changes to urban environments, such as the design, repurposing, or maintenance of blue spaces, can influence physical and mental health. These impacts can be positive or negative. Consequently, it is important to take these impacts into account in decision making and to use an evidence-based approach. A key aspect of such an approach is that various kinds of data are systematically collected and analysed before and after any intervention is made in order to identify what 'worked', how it worked, and what challenges remain.

The BlueHealth toolbox was designed with these processes in mind. It enables information on blue spaces to be collected consistently for any planning or design interventions both before and after implementation. This information includes key aspects of environments (including risks and benefits), the status and behaviours of their users, and the opinions of other parties who might be affected by an intervention.

The BlueHealth Toolbox

The BlueHealth Toolbox comprises six tools that gather data on the environmental characteristics of blue spaces; how these spaces are used; the behaviours of people within them; and the perceptions, experiences and health status of people who engage with blue spaces directly (through visiting them), or indirectly (by living nearby).

Each tool is designed to work at a particular spatial scale – from site to country level (Figure 1). All tools can be used at any point in the process of changing a blue space.

They are most informative when used pre- and post-intervention, particularly when they are administered at multiple points in time (Figure 2).

The Toolbox is a set of diagnostic tools for collecting information about places and the people using or affected by them. They are not designed to understand the governance processes that inform the planning and management of blue spaces or their location. Stakeholder engagement is needed alongside Toolbox results to identify and communicate the societal benefits of any intervention. Visit: bluehealth2020.eu/scenarios

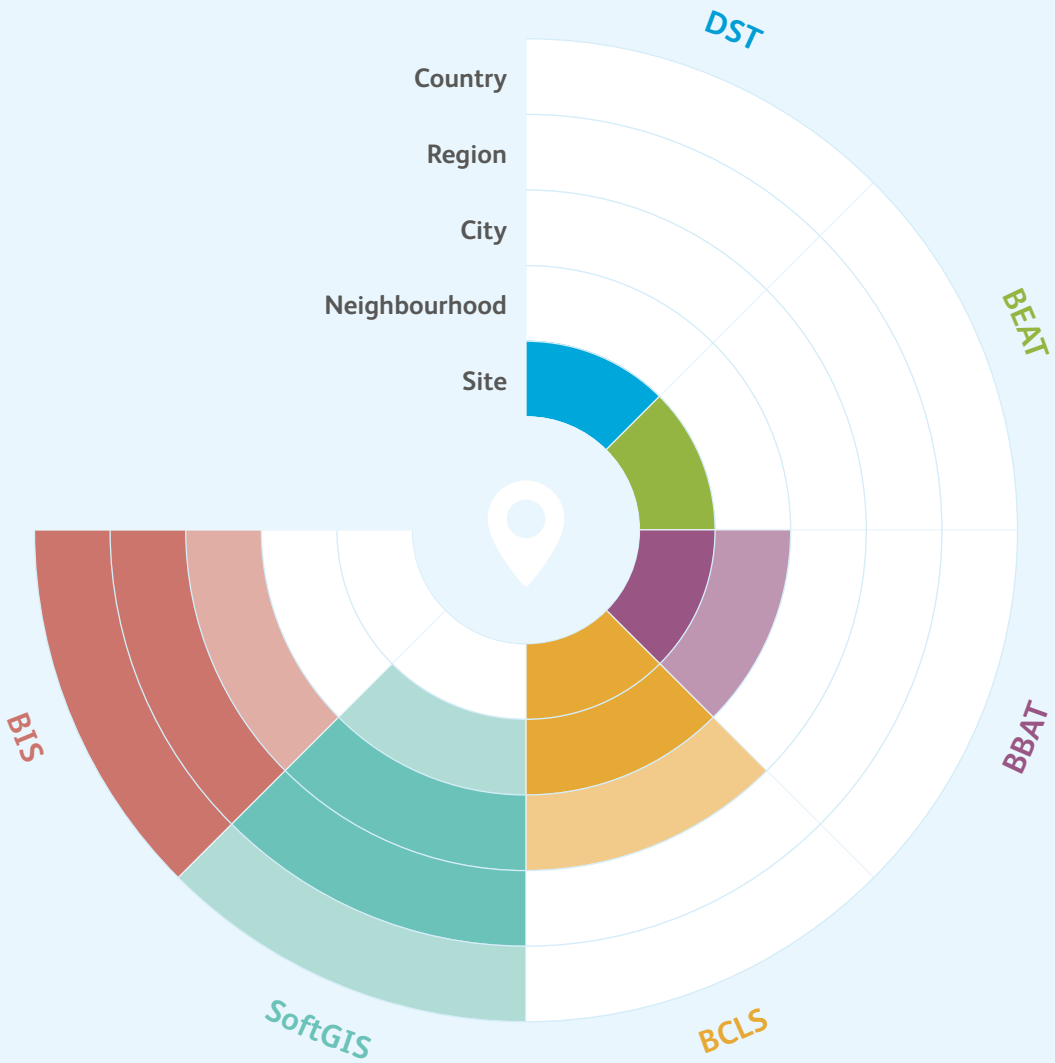


Figure 1: Employing BlueHealth Toolbox at different spatial scales.
Lighter tone indicates tool can be applied in some cases

Using the tools together

Individually, each tool provides information on a key set of characteristics relating to the site, typically before and after an intervention.

Used in combination within a single, integrated assessment framework (the BlueHealth Toolbox), the tools have the potential to provide an evaluation team with a very rich data set on multiple aspects of a blue space and the human populations affected by it.

There are three core dimensions to consider when selecting which tools to employ in assessing a specific intervention:

1. The **spatial scale** relevant to the effects of an intervention.
2. The **timing** of an intervention evaluation
3. The **population** that may be impacted by an intervention.

Spatial scale

Some tools, such as the BBAT, are designed to assess characteristics at the site level. Others can be used at multiple spatial scales, such as the BIS, which can be administered at international, regional, and city levels (see Figure 1). This allows users to select the tool most appropriate for their needs.

Timing

Ideally the tools should be applied before and after any change is made to a site or its users (an 'intervention'). This will allow the user to reveal and quantify the effects that an intervention has on health and wellbeing. As the characteristics of most environments vary over daily, seasonal and annual timescales, so does their usage and the health status of those using them. For a fair evaluation, it is important to collect data at multiple points before and after any intervention (Figure 2). This applies for both environmental characteristics and health status.

Population

Consideration should be given to several populations when investigating how people use, feel about, or are otherwise affected by a site and changes in it. On-site interviews will only ever provide information about current users of an urban blue space, and nothing about those who are prevented from visiting by any of several barriers. Doorstep interviews and the like provide useful information about those populations assumed to have a relationship to the site (even if they do not visit it), but some blue spaces are potential destinations for populations spread across whole cities. SoftGIS provides a partial solution to this, but it too relies on very partial and potentially biased sampling as a result of it being an online platform.

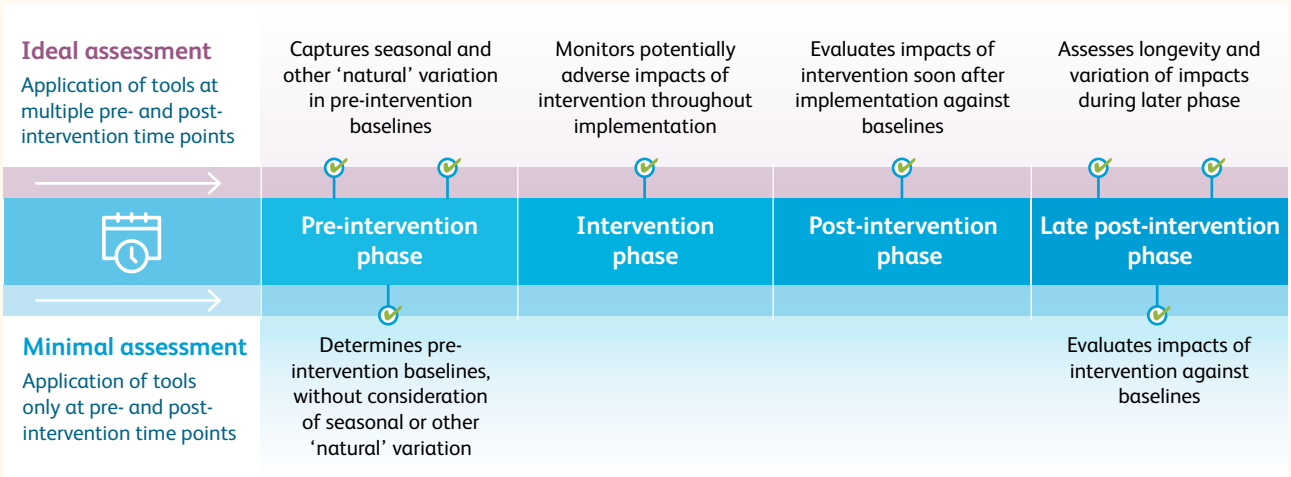


Figure 2: Using the BlueHealth Toolbox throughout an intervention.

BlueHealth

Environmental Assessment Tool (BEAT)

bluehealth2020.eu/BEAT

What is it?

The BlueHealth Environmental Assessment Tool (BEAT) provides robust, objective measures of the environmental character of a blue space, including the terrestrial and aquatic systems within the site[23].

How does it work?

The tool guides the user through:

1. A preliminary desk-based study that collects data on a site's location and character.
2. An on-site evaluation of the site's character.
3. The main survey, in which the social, aesthetic and physical characteristics of the site are scored.
4. An evaluation of the aquatic ecosystem.

The BEAT is primarily designed to be used as an online tool, but it is also available for download, allowing a printed version to be used on sites without internet access.

Who is it for?

Two versions of the tool have been developed:

A **Professional BEAT** for professional users, such as landscape architects, ecologists, recreation planners, urban planners and hydrologists who have expert knowledge of the relevant domains and may have sophisticated methods or instruments available to assess the character of the site.

A **Community BEAT** for community groups with an interest in their local environment and who are seeking information on aspects of a blue space to inform their activity, perhaps as a citizen science or educational project, or in support of funding applications for other activities. This version of the tool is shorter and less complicated to use.

An example of data types collected by the BEAT

BlueHealth

Decision Support Tool (DST)

bluehealth2020.eu/DST

What is it?

Once a site has been characterised, the BlueHealth Decision Support Tool (DST) helps identify the key health-related risks and benefits of a given blue space.

It provides a novel means of approaching planning, management and maintenance of blue infrastructure, with both health promotion and the prevention or reduction of potential health risks in mind. The tool highlights threats and ways to mitigate them, as well as spotting possible opportunities for boosting public health and wellbeing.

How does it work?

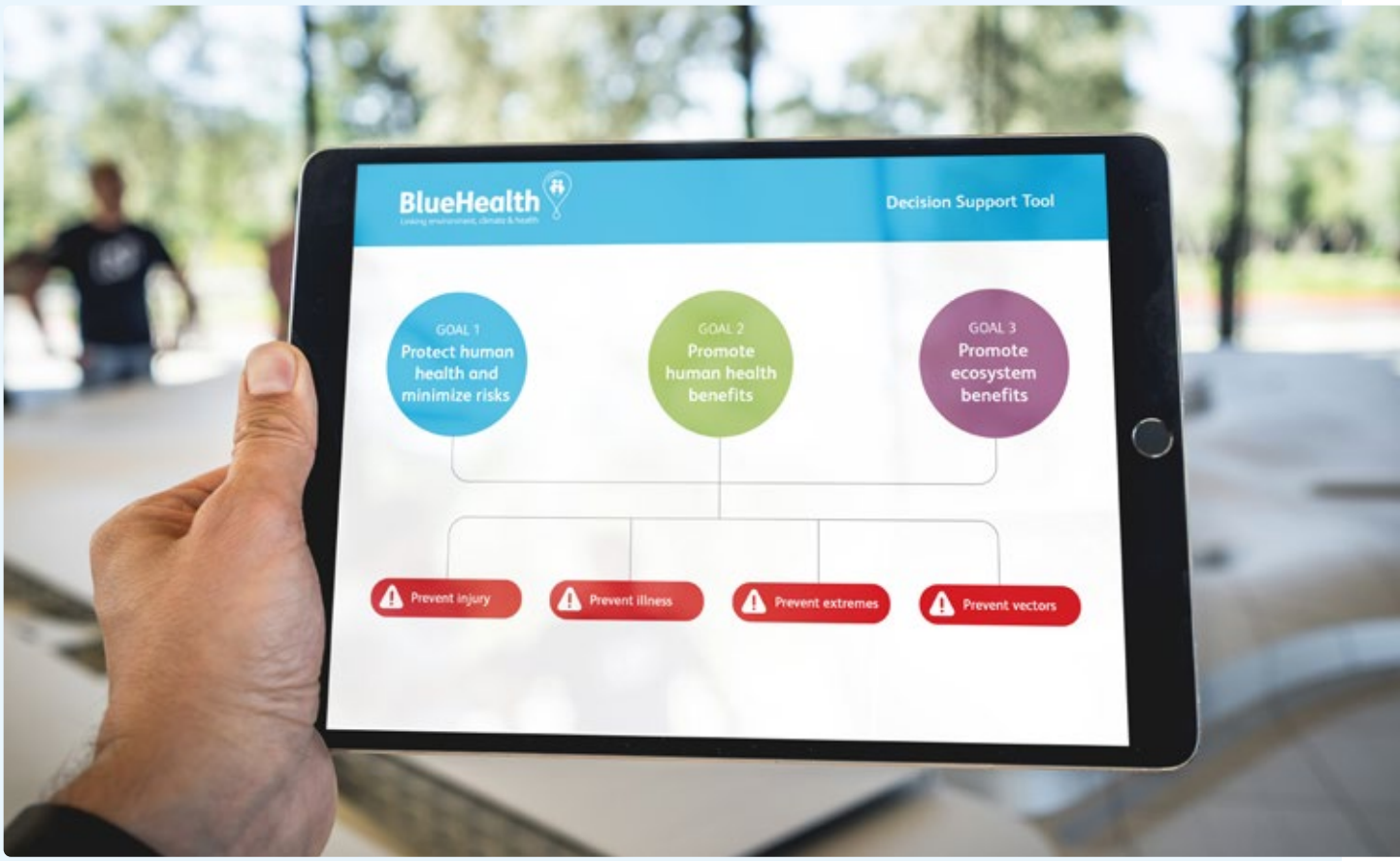
The tool allows the user to select one of six different blue spaces, namely marine environments, rivers, lakes, urban water bodies, blue spaces in green space (parks etc.), and ornamental blue spaces like fountains.

The DST identifies the scale of threats, opportunities, and populations likely to be affected. This guidance can be used for planning and management based on three key outcomes:

1. Human health risks related to blue spaces, such as drowning, illnesses, vector-borne diseases, or climate-specific factors like UV exposure.
2. Human health benefits, such as opportunities for physical activity, or improvements in mental and social wellbeing.
3. Ecosystem and environmental benefits, such as improved air and water quality, regulating climate conditions like heat island effects, and protecting biodiversity.

Who is it for?

It is suitable for urban planners, architects, policy-makers, estate managers, and others. It is an online tool developed to be used at a site, or by evaluators with a very good knowledge of the site's characteristics.



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Behavioural Assessment Tool (BBAT)

bluehealth2020.eu/BBAT

What is it?

The BlueHealth Behavioural Assessment Tool (BBAT) helps determine how people use blue spaces. It captures who is doing what and where, and allows users to make comparisons between different groups and activities, as well as recording the weather and water conditions (tides and waves for example).

How does it work?

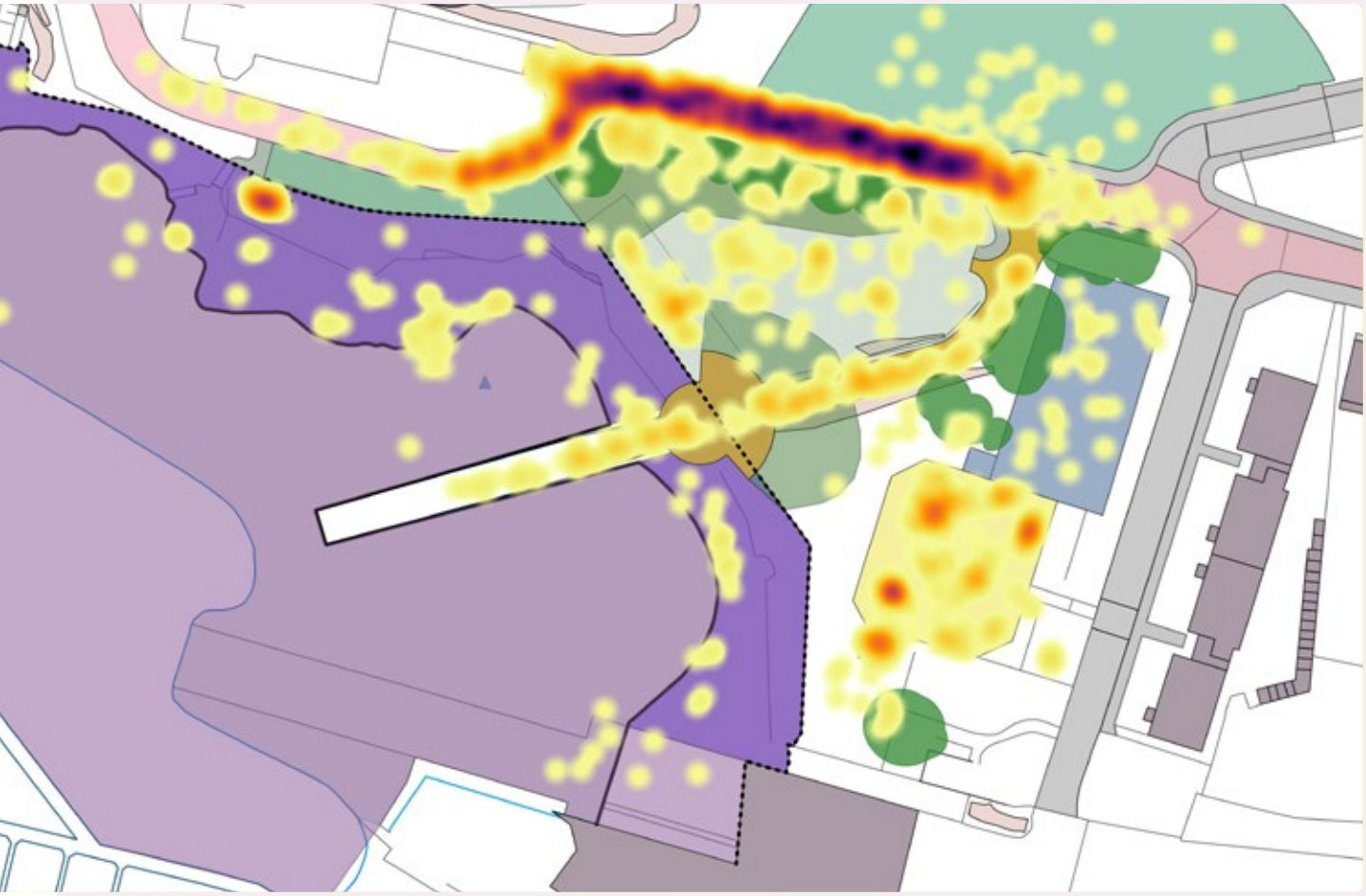
The BBAT can be run on a tablet or laptop using a geographical information system (GIS). A map of the site is loaded into the software and observations of diverse human behaviours and interactions can be systematically recorded at specific locations.

Once the data are collected, outputs can be visualised in geographic and statistical ways. These maps allow opportunities for interventions to be identified – particularly those relevant to specific user groups.

Who is it for?

BBAT can be used by planners, landscape architects, designers and scientists interested in how sites are used. Community groups might use the tool to support proposals for altering a particular site to bring benefits to local people.

BBAT data demonstrating blue space users and activities



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Community Level Survey (BCLS)

bluehealth2020.eu/BCLS

What is it?

The BlueHealth Community Level Survey (BCLS) is a questionnaire designed to find out how communities engage with blue spaces, their perceptions (of safety, quality etc.), and how blue spaces – and blue space interventions – might affect the wellbeing of individuals and communities.

How does it work?

BCLS was designed to serve as a shorter, site-specific version of the BlueHealth International Survey (BIS, see below). The inclusion of items common to the BIS allows findings made at different scales (locally, nationally or at city-level) to be directly compared and put into a wider context.

Who is it for?

This tool is particularly suitable for exploring how communities potentially affected by changes to a local site. The flexibility of the BCLS, which can be printed on paper and posted, delivered as an online survey, or used in face-to-face interviews, means that it can be used on- and off-site, and with targeted populations (e.g. representatives of particular groups).

Photo of a BlueHealth intervention along the Anne Canal in Tartu, Estonia

BlueHealth

SoftGIS

bluehealth2020.eu/SoftGIS

What is it?

The SoftGIS approach was developed in at the Helsinki University of Technology in the 2000s, inspired by research projects that sought to collect knowledge from local actors about their living environments and surroundings using Internet based map applications[24].

A blue space located at a particular place in a city might provide interactions for people living some distance away. Whereas surveys such as the BCLS can be administered to those living near a given site with relative ease, engagement with users further afield presents considerable challenges.

How does it work?

SoftGIS is a geographical information systems (GIS) tool that enables participatory mapping, for example by allowing residents of a city to share their knowledge about their living environment with urban planners and researchers. SoftGIS operates in a web browser, overlaid on a zoomable map.

Who is it for?

SoftGIS can be used by anyone with an interest in understanding how residents of a particular city interact with local blue spaces, and to gauge what these places mean to them. For example, SoftGIS can be used to identify the favourite blue spaces in a city, those that are avoided, blue spaces that are under- or overused, and opportunities for developing new blue spaces.

Utrecht Park, Danielle van Rossum

BlueHealth

International Survey (BIS)

bluehealth2020.eu/BIS

What is it?

The BlueHealth International Survey (BIS) is a bespoke online questionnaire designed to answer similar questions to the BCLS, but at a higher spatial scale.

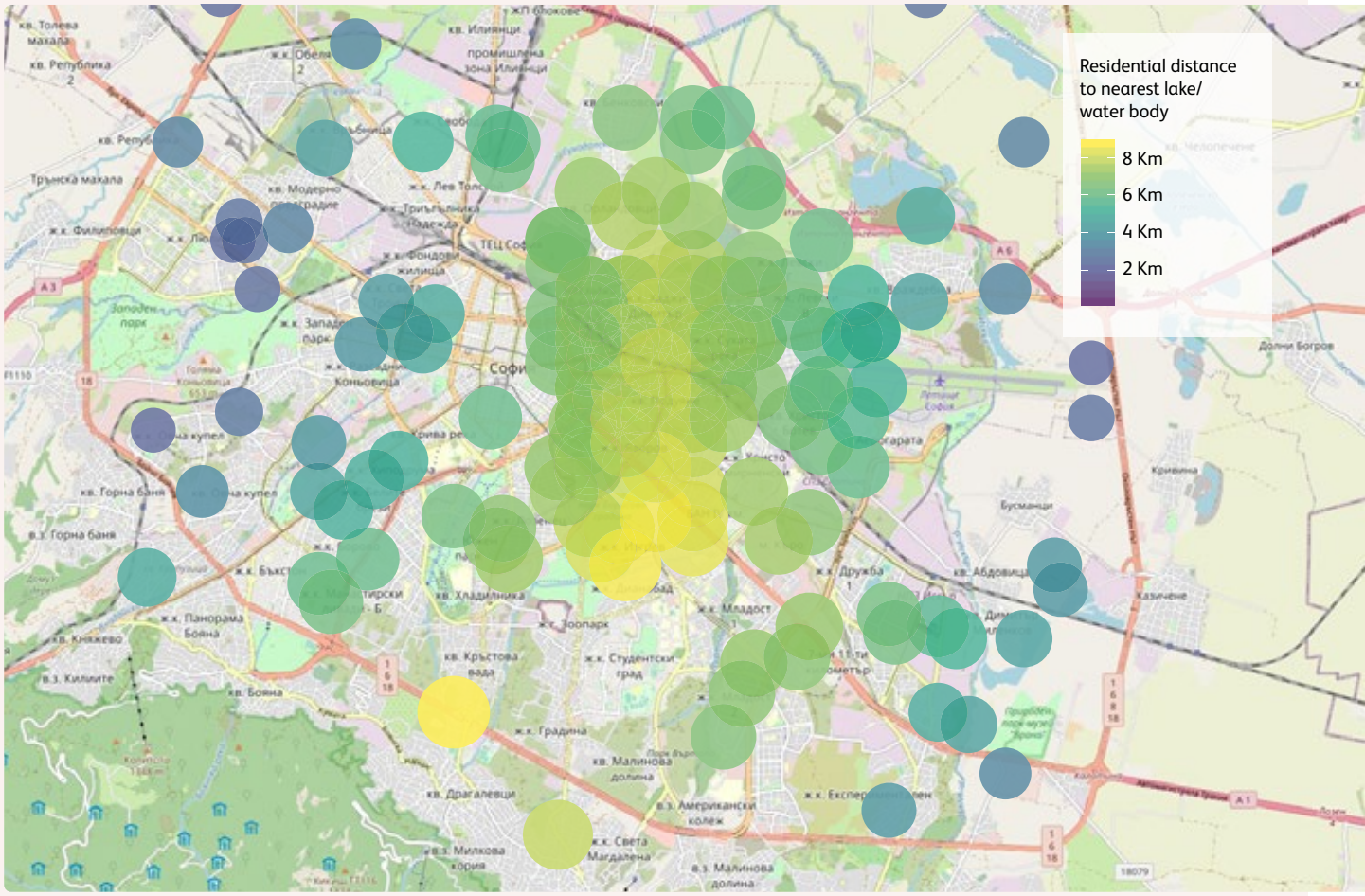
How does it work?

Used in isolation, the BIS allows the collection and analysis of rich data on how frequently different kinds of blue spaces are visited and how far people travel to reach them, as well as self-reported measures of health and wellbeing. This tool provides insights into factors that influence health, such as links between wellbeing and frequencies of visits. Used in parallel with other BlueHealth tools, it provides national or regional benchmarks that can be compared at a city or site level. The only constraint is whether suitable online panels exist at those levels.

Who is it for?

The BIS is used by researchers, particularly environmental psychologists and epidemiologists, economists, social scientists, and others with an interest in understanding how populations are affected by blue spaces alongside other urban and natural environments.

BIS shows spatial associations between health and residential proximity to lakes in Sofia, Bulgaria



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The majority of Europe's population live in urban areas characterised by inland waterways and coastal margins.

The pan-European and interdisciplinary research initiative, the BlueHealth Project, researched how these environments can affect health promotion and disease, while working with communities, private sector organisations and policymakers.

For case studies, publications and contact details of researchers involved please visit: www.bluehealth2020.eu

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