

BlueHealth Environmental Assessment Tool (BEAT)

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“blue spaces” – as an outdoor environment, either natural or manmade-that prominently feature water and are accessible to humans either proximally (being in, on or near water) or distally/ virtually (being able to see, hear or otherwise sense water)
(Grellier et al., 2017, p. 3)

Defining “blue space”



- ❑ Many tools are available that assess green space, built environment for health and planning and design (Mishra et al., 2020; Gidlow, et al., 2012).
- ❑ The pathways linking green space and health thought to be similar for blue spaces (White et al., 2020), but a unique instoration and restoration abilities associated with blue space setting have been recognised.
- ❑ Research people recognise and value more to cultural ecosystem services more than other services (e.g. provisional services) of natural environment and more references are made intrinsic and sensorial aspect of the nature (Lyytimäki and Pitkänen, 2020)

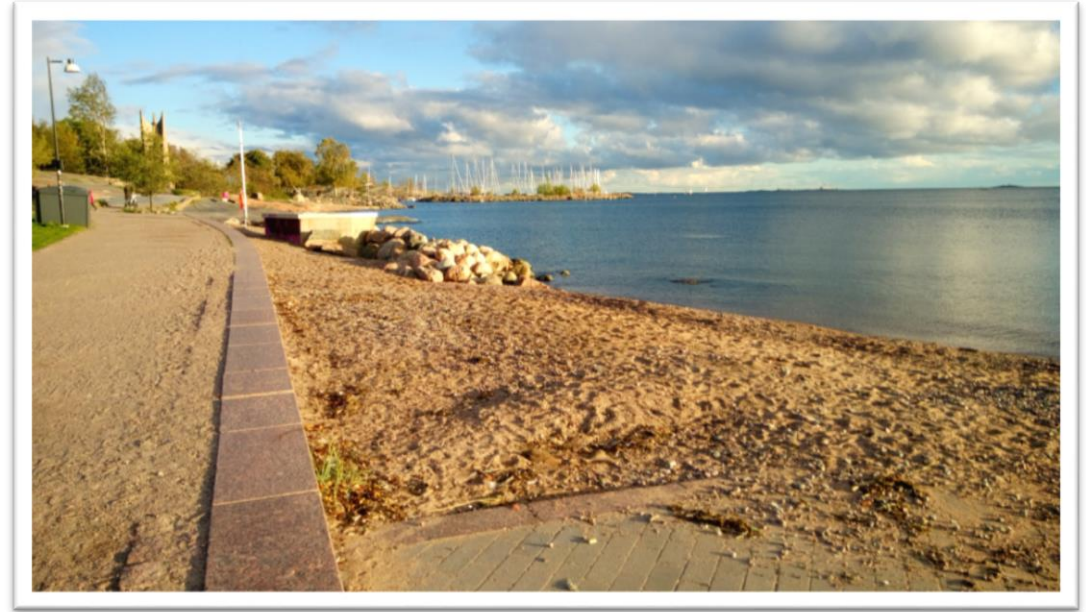


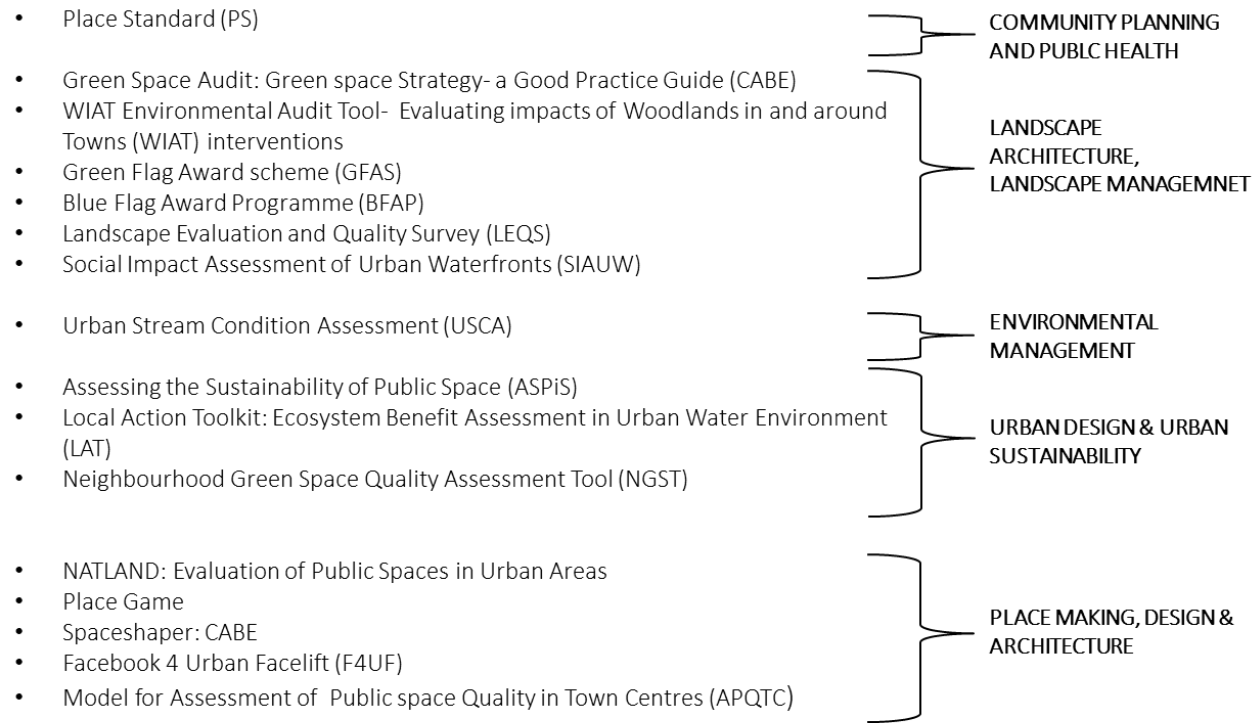
Rationale: Development of BlueHealth Environmental Assessment Tool (BEAT)



- ❑ Blue space attributes, health, and well-being benefits are **unique compared to green spaces**.
- ❑ **Coastal or inland waterbodies, are prime locations for leisure and tourism**, homes or hotels with water views are significantly more expensive.
- ❑ Person-Environment interaction model for blue space to understand the **blue space-health relationships**.
- ❑ The role of blue space **affordances and affect** for health and well-being.

Evidence: Concepts and approaches





Planning tools

- Audit Tool Checklist Version Neighbourhood Environment (Road segments)
- Audit Tool analytical Version Neighbourhood Environment (Road segments)
- Active Neighbourhood Checklist (ANC) Neighbourhood Environment (Road segments)
- BRAT-Do Instrument Urban Park
- Community Park Audit Tool (CPAT) Urban Park, Community Park
- Environmental Assessment of Parks and Playground Public Recreation Spaces (EAPRS) Tool
- Path Environment Audit Tool Trails and Paths (PEAT)
- Physical Activity Resource Assessment (PARA) Instrument Parks, churches, schools, sports facilities, fitness centers, community centers, and trails
- SOPARC School Play area setting
- SOPARNA Park and trails
- SOPLAY Park and Greenspace
- Systematic Pedestrian and Cycling Environmental Scan Pedestrian and cyclist environment
- Walking and Bicycling Suitability Assessment (WABSA) Walking and Bicycle routes
- Walking Route Audit Tool for Seniors (WRATS) Pathways and walking and cycle routes

Public health research tools

❑ The tool has been developed based on a systematic review using 39 existing place assessment tools;

Type of tools reviewed



- ❑ The theme which the tool functions Country and year of publication
- ❑ The type of place or space under assessment
- ❑ The scale of the place or space under assessment
- ❑ Aim of the assessment and assessment types
- ❑ Domains, factors, and criteria
- ❑ Contributing discipline and intended users
- ❑ Structure of the tool
- ❑ Complexity, length, number of question asked
- ❑ Data collection and assessment method
- ❑ Scoring methods
- ❑ Presentation and communication of the result
- ❑ Validity and reliability of the tool

Review of place assessment tools for health

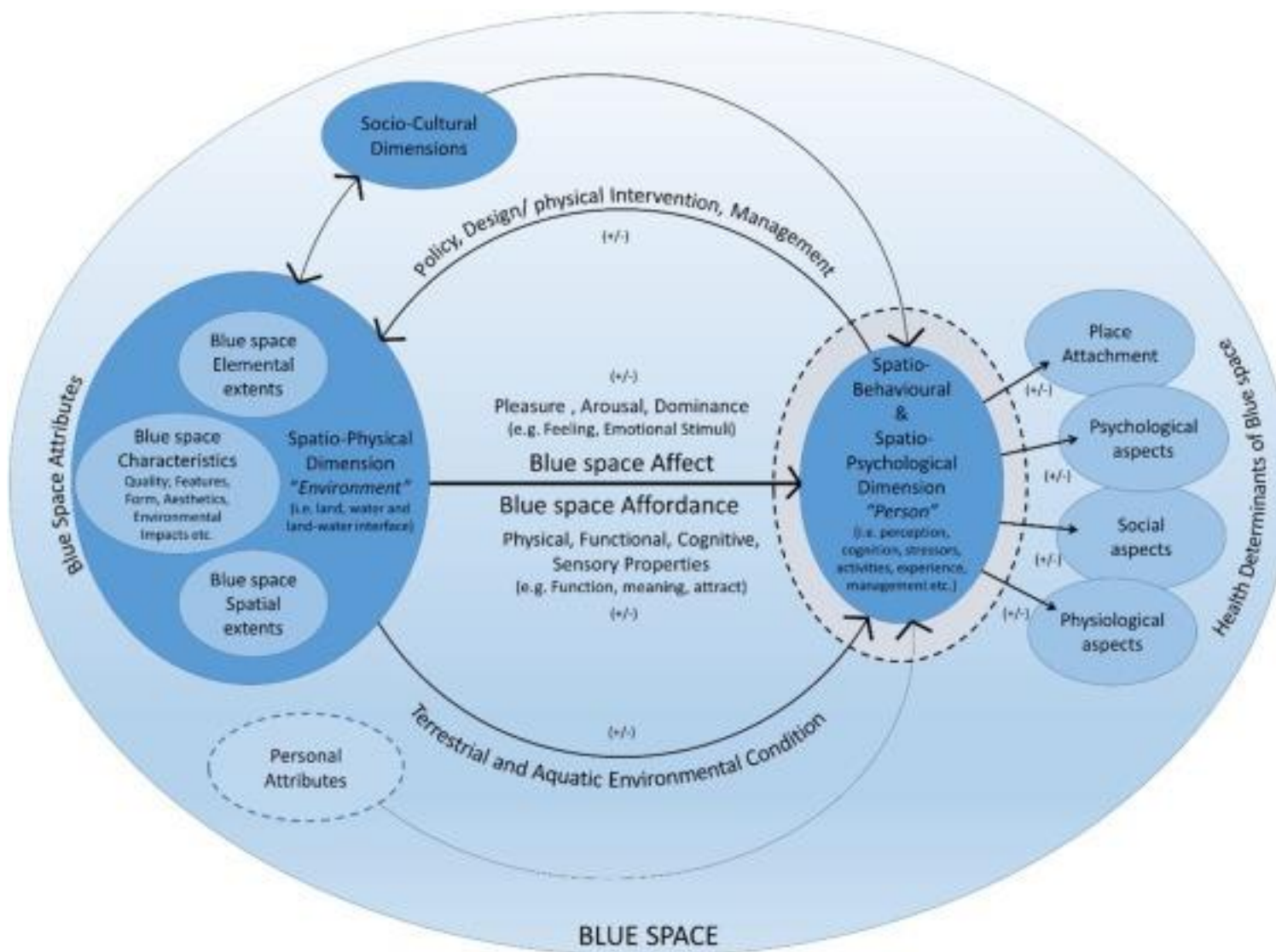


- ❑ BEAT has been developed as part of planning and design of blue spaces for pre and post intervention assessment using an evidence-based approach;
- ❑ Evaluates a place in a holistic way, through integrating a number of domains (such as the social, physical , aesthetical);
- ❑ Elements of tool are objective and measurable on-site, systematic, and can be administered by single person;
- ❑ BEAT is developed for experts, researchers, and local communities;
- ❑ BEAT enables comparable assessment of environmental aspects and attributes.
- ❑ The tool provides robust, objective measures of the environmental character of a blue space.



Development of BlueHealth Environmental Assessment Tool (BEAT)

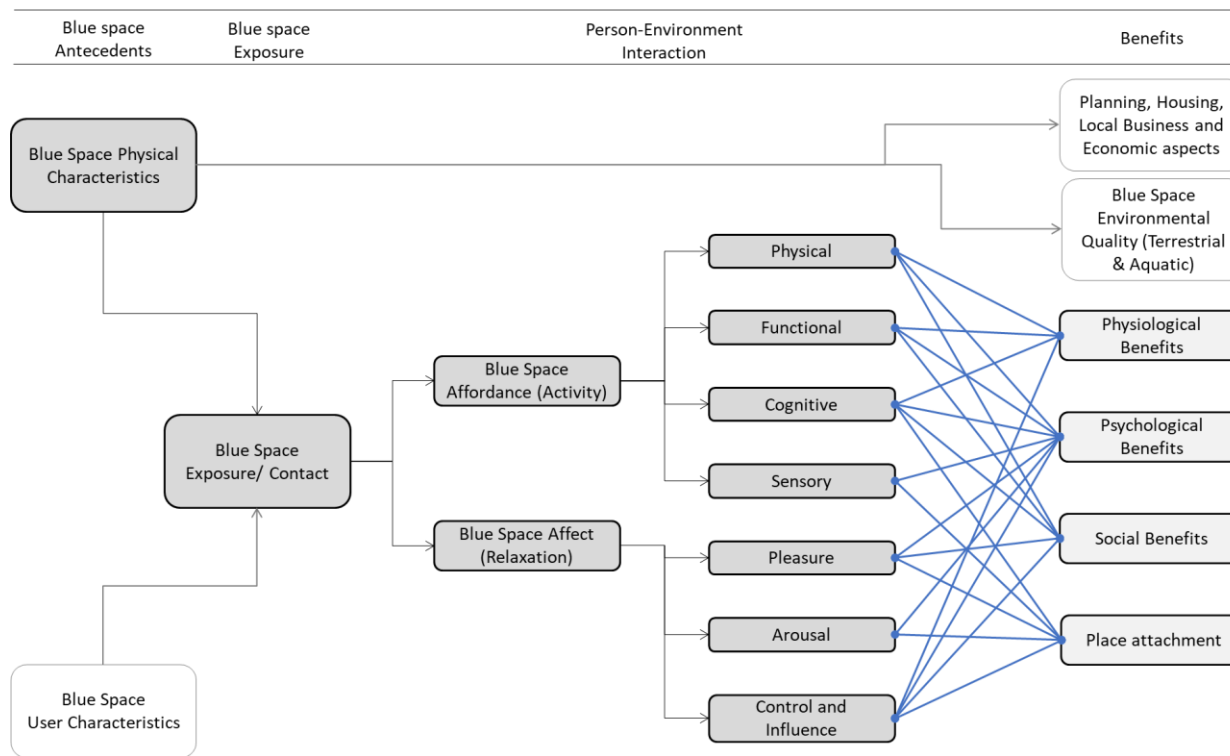




The Person-Environment interaction model for Blue Space and health outcomes which forms the theoretical basis for the BEAT (Mishra et al., 2020).

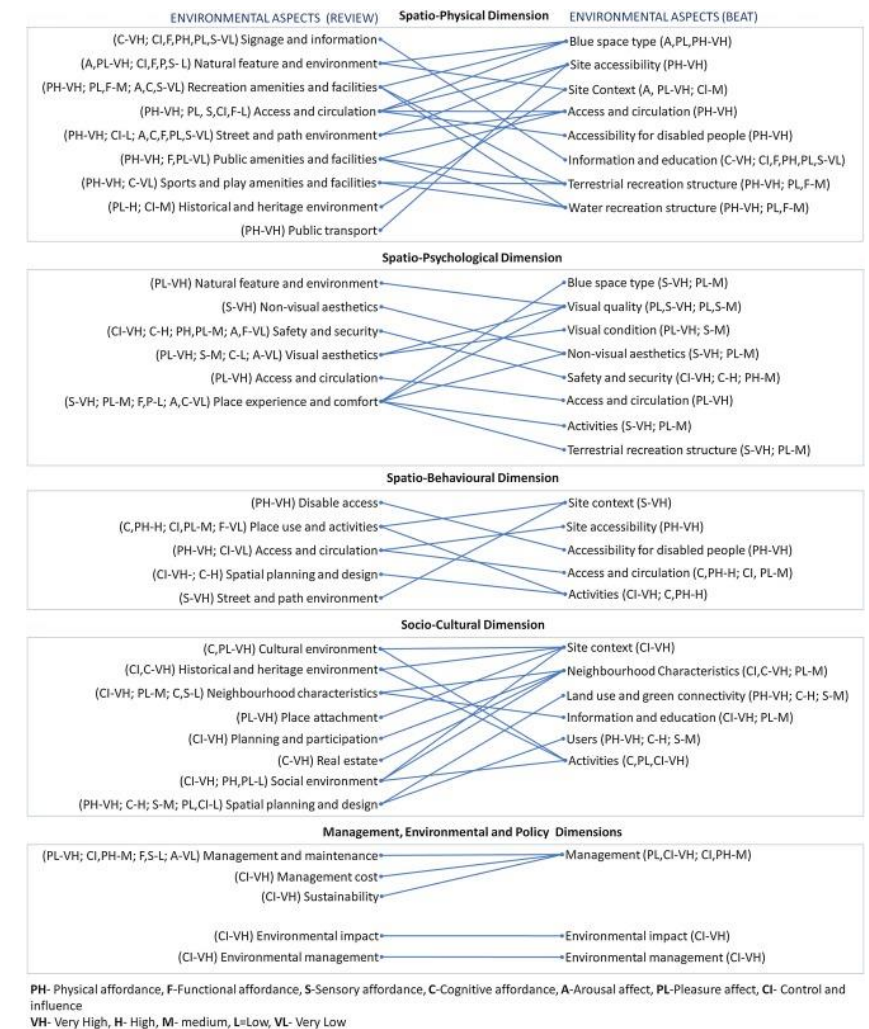
Concepts and theoretical framework





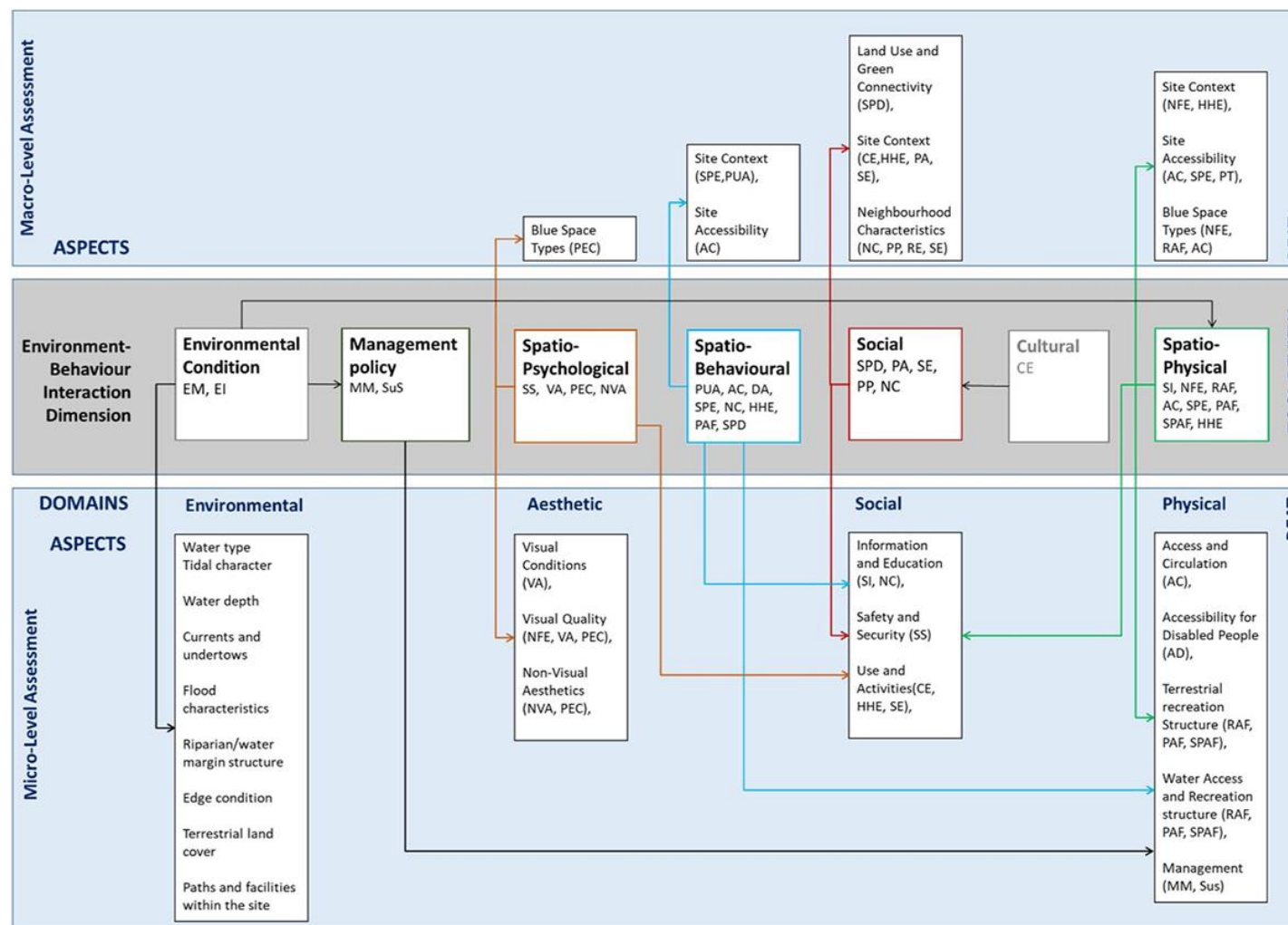
Left- An interaction model for Blue Space use for physical activities and relaxation. . (Mishra et al., 2020)

Right- Mapping across aspects extracted from the review to the BEAT aspects and their importance for their health antecedents. (Mishra et al., 2020)



Concepts and theoretical framework





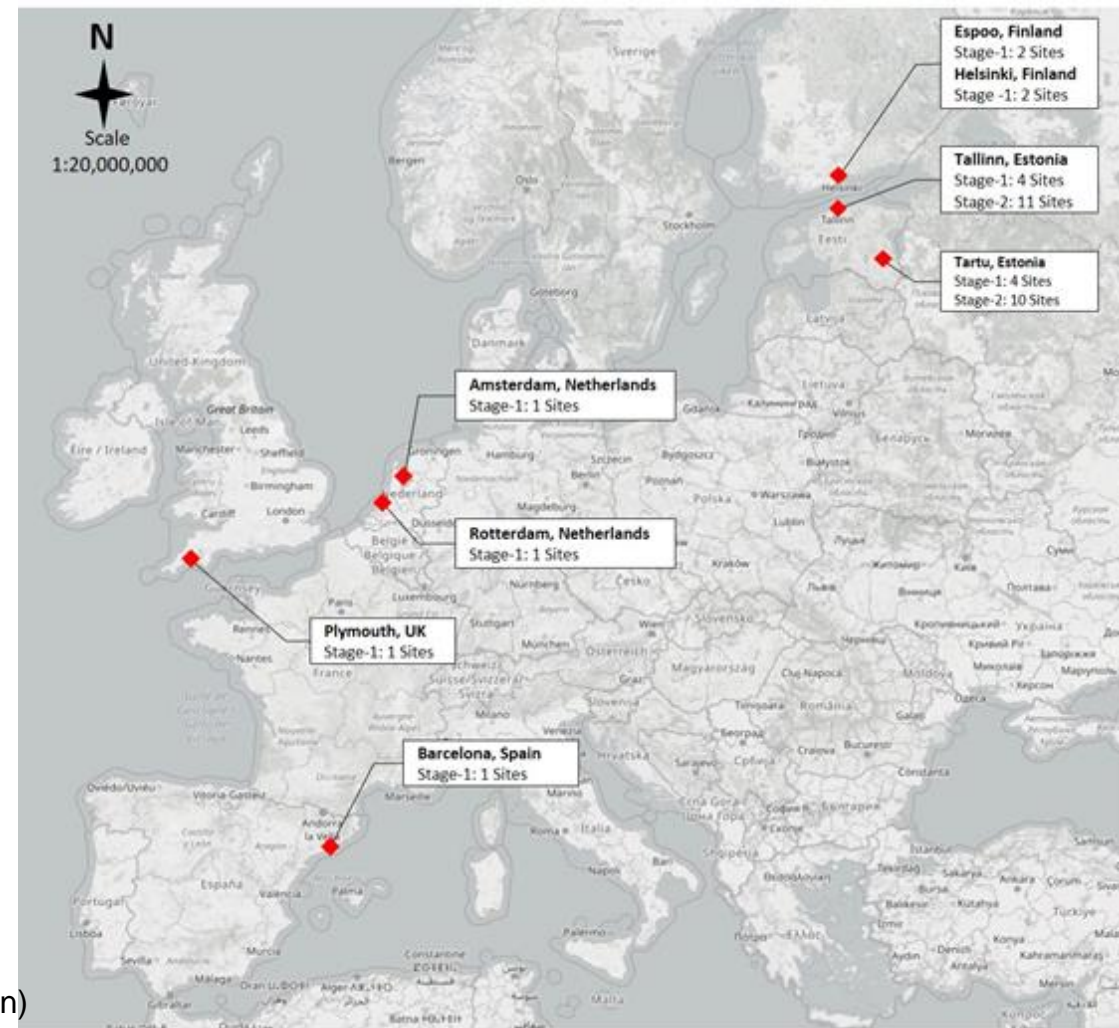
BEAT domains and aspects derived from the review framework (Mishra et al., 2020).

Concepts and theoretical framework



Health and Place
Testing the reliability and effectiveness of a new tool for assessing urban blue spaces
The BlueHealth Environmental Assessment Tool (BEAT)
--Manuscript Draft--

Location of sites assessed
(Mishra et al. N.D, accepted with revision)



Application and Validation of Environmental Assessment Tool (BEAT)



- ❑ Each domain is subdivided into several factors or criteria, assessed separately
- ❑ A simple scoring system (1-5 to objectively assess the quality) and 0 for the attributes absent or not relevant in the context.
- ❑ Tool has been divided into Four simple steps:
 - Step 1:** Preliminary Data about the site (macro-level assessment)
 - Step 2:** General Site Description (micro-level assessment)
 - Step 3:** On site Survey (terrestrial environment)
 - Step 4:** On site Survey (aquatic environment)

Description of BlueHealth Environmental Assessment Tool (BEAT)



Bluehealth Environmental Assessment Tool (BEAT)

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BlueHealth Environmental Assessment Tool (BEAT) Professional Version

In order to provide places where people can enjoy access to water and also obtain many of the health and well-being benefits associated with such blue spaces, it is important to be able to make effective links from a planning and design perspective. A tool for evaluating a place in a holistic way, through integrating a number of domains (such as the social, physical or ecological), and which enables the positive and negative aspects to be identified is needed.

The tool presented here provides a comprehensive method of assessing all relevant domains related to 'blue spaces' (any outdoor space that prominently features water, and which individuals may experience, whether by direct contact in, on or by the water, or by indirect means such as seeing it). The tool is designed primarily for identifying the extent to which a particular blue space provides opportunities for obtaining exposure to water but

Survey page

Bluehealth Environmental Assessment Tool (BEAT)

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BEAT Survey Guidance notes

Guidance Notes for the
Professionals

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Guidance Notes for the
Community

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Guidance on water ecosystem
assessment

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Survey Forms (terrestrial)

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Survey Forms (aquatic)

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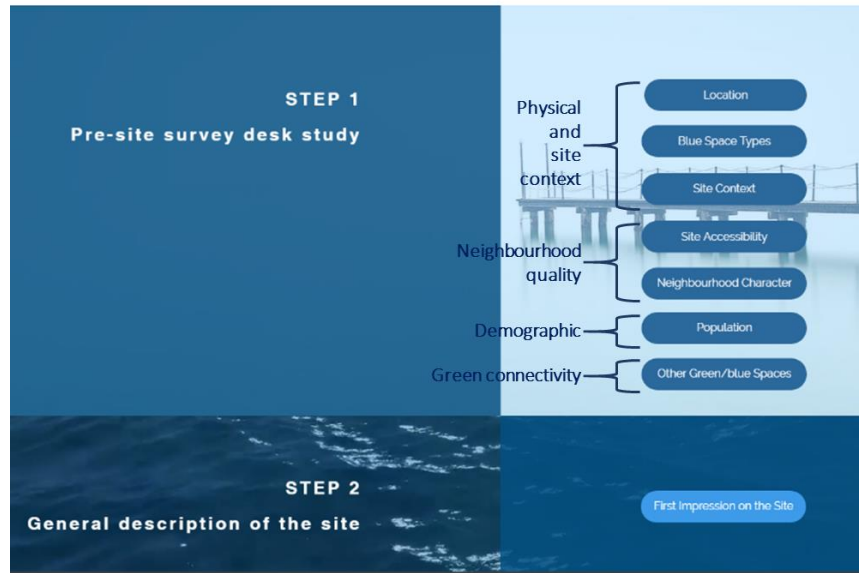
BEAT Training

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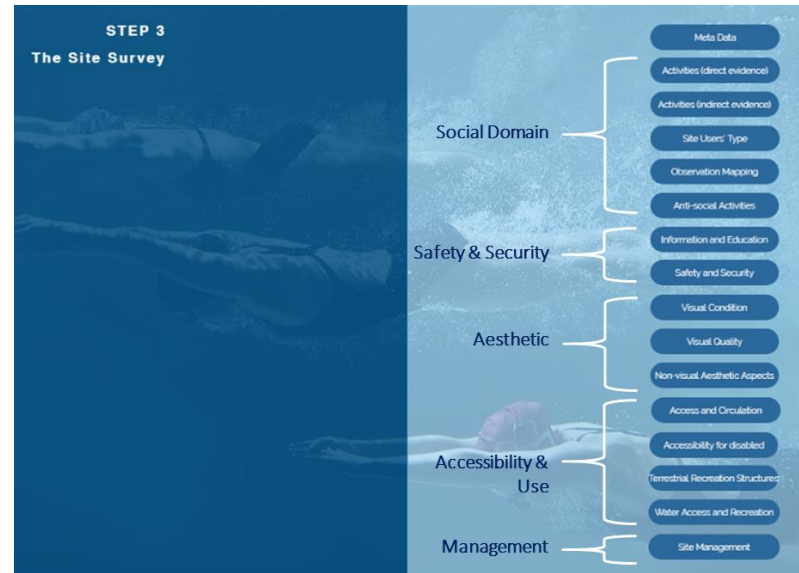
Guidance page

Basic Description of BlueHealth Environmental Assessment Tool (BEAT)- BEAT: Online Survey Tool-
<https://www.beat.bluehealth.tools/>

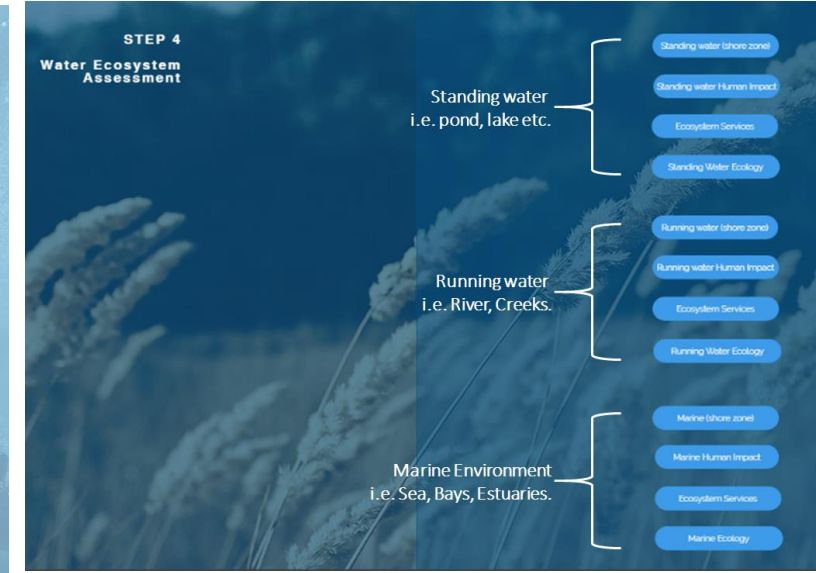




BEAT Step 1 and 2



BEAT Step 3



BEAT Step
4

BEAT: Online Survey Tool- Steps



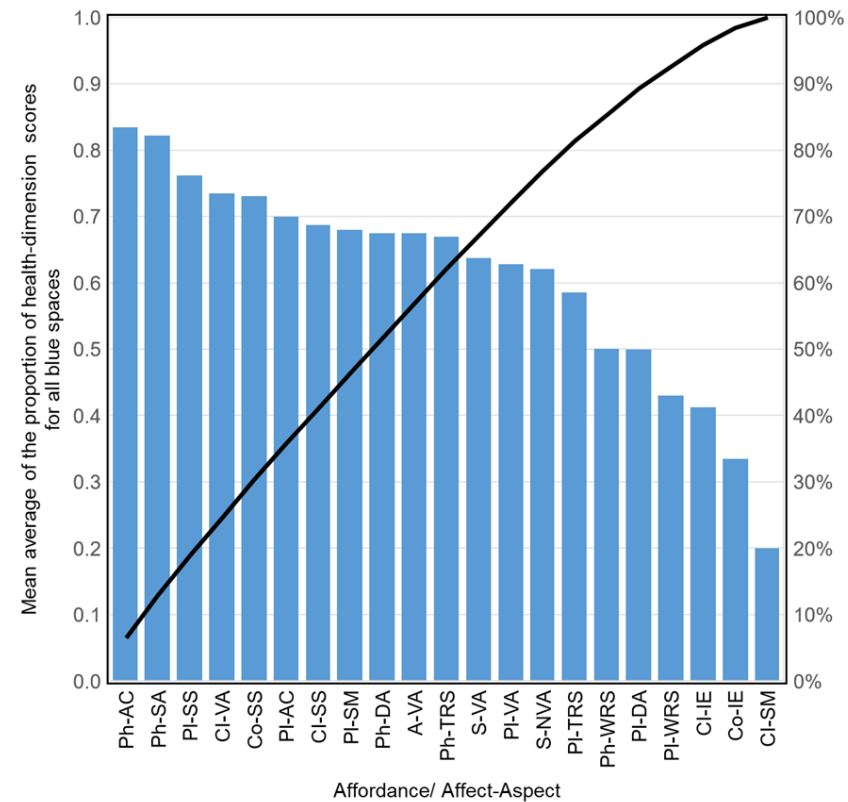
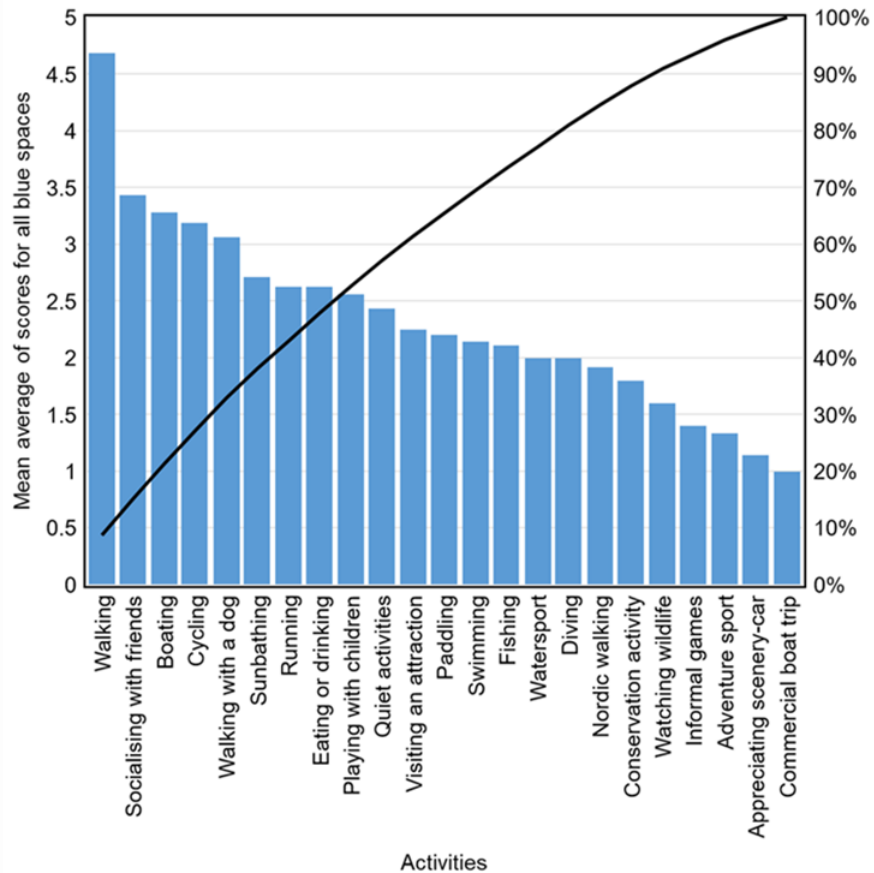
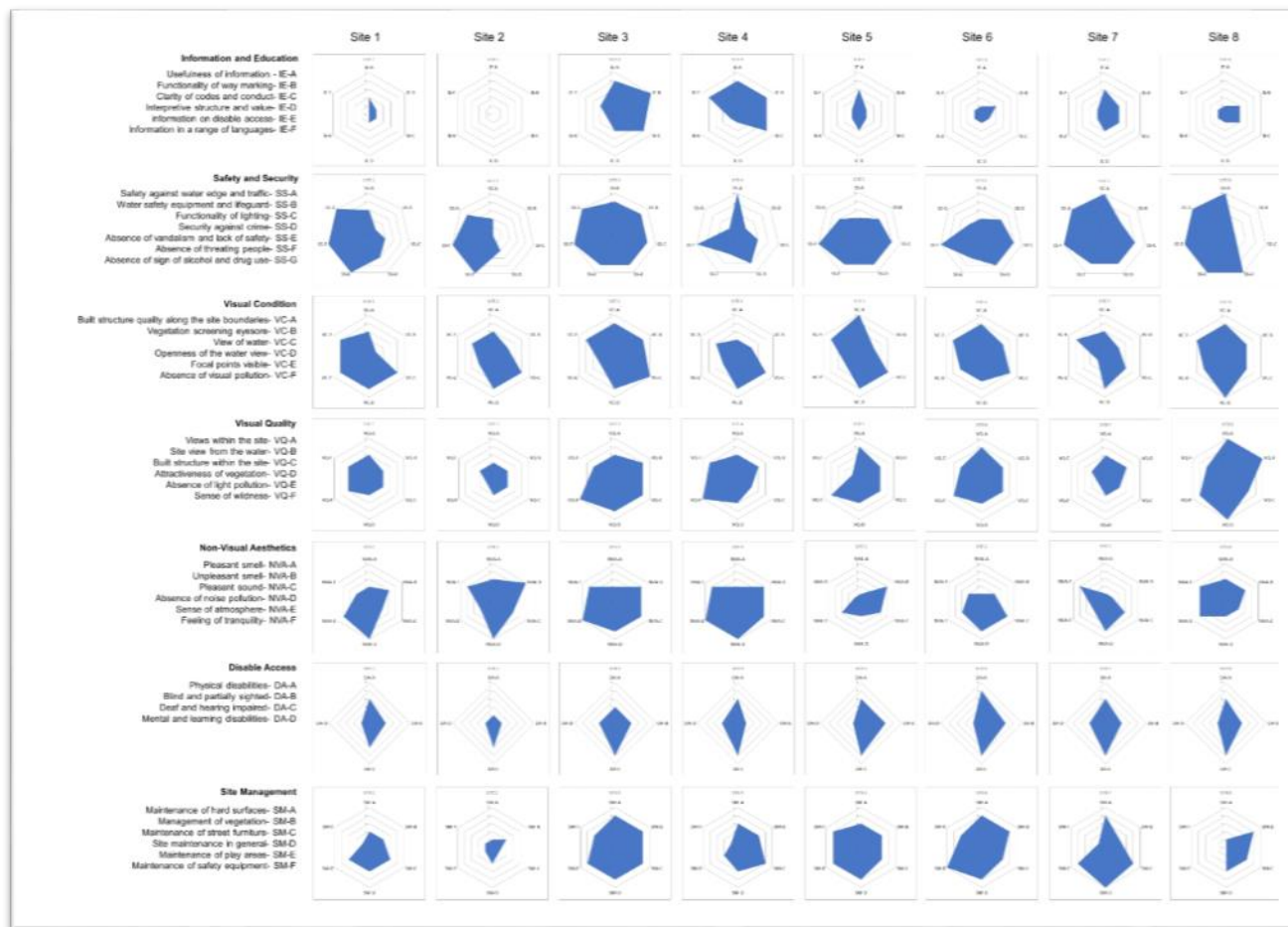


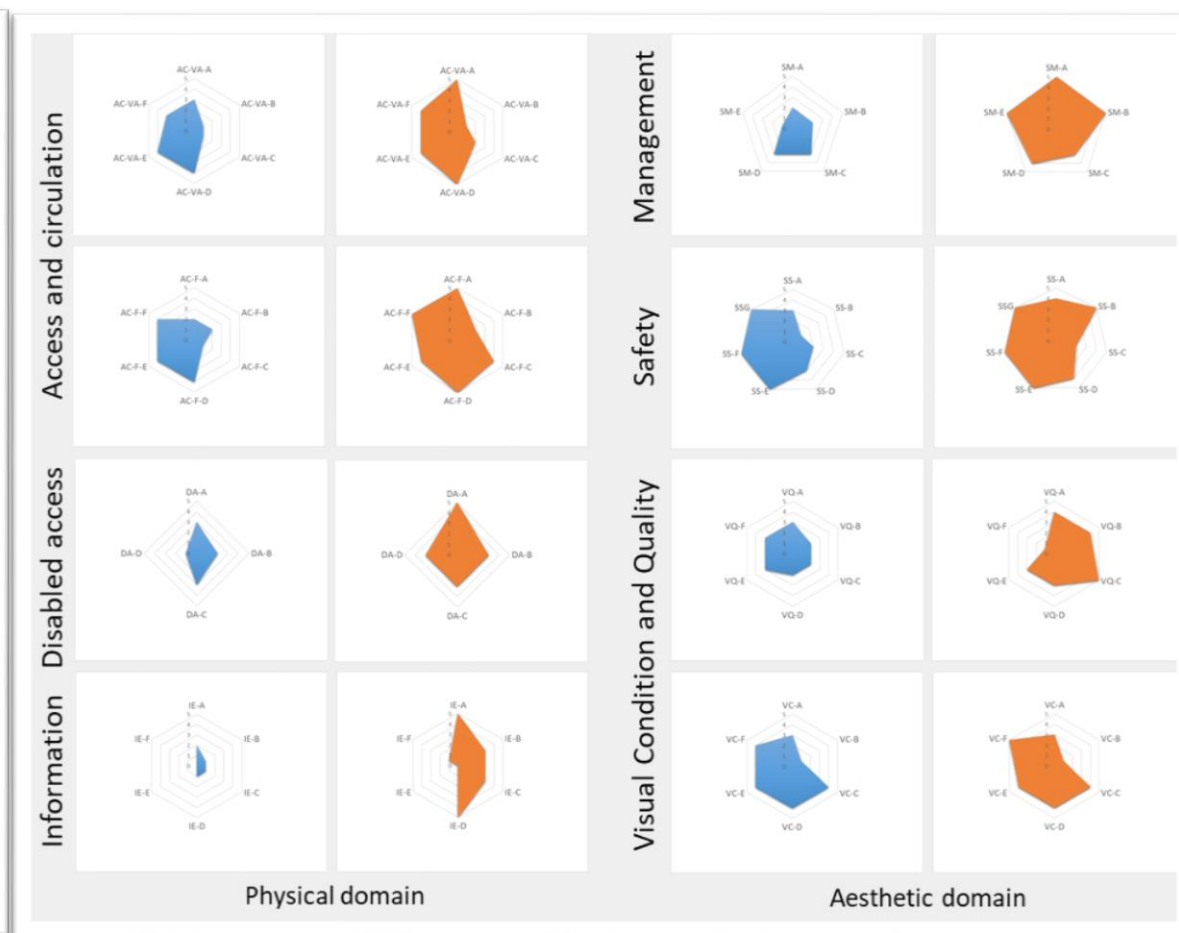
Chart illustrating the frequency of distribution of appropriated activities and health-dimensions of attributes for all blue spaces e.g. physical, pleasure

BEAT: Site Assessment and Analysis of Scores for the Terrestrial Environment





Moderated rating scores for aspects and attributes of the physical domain



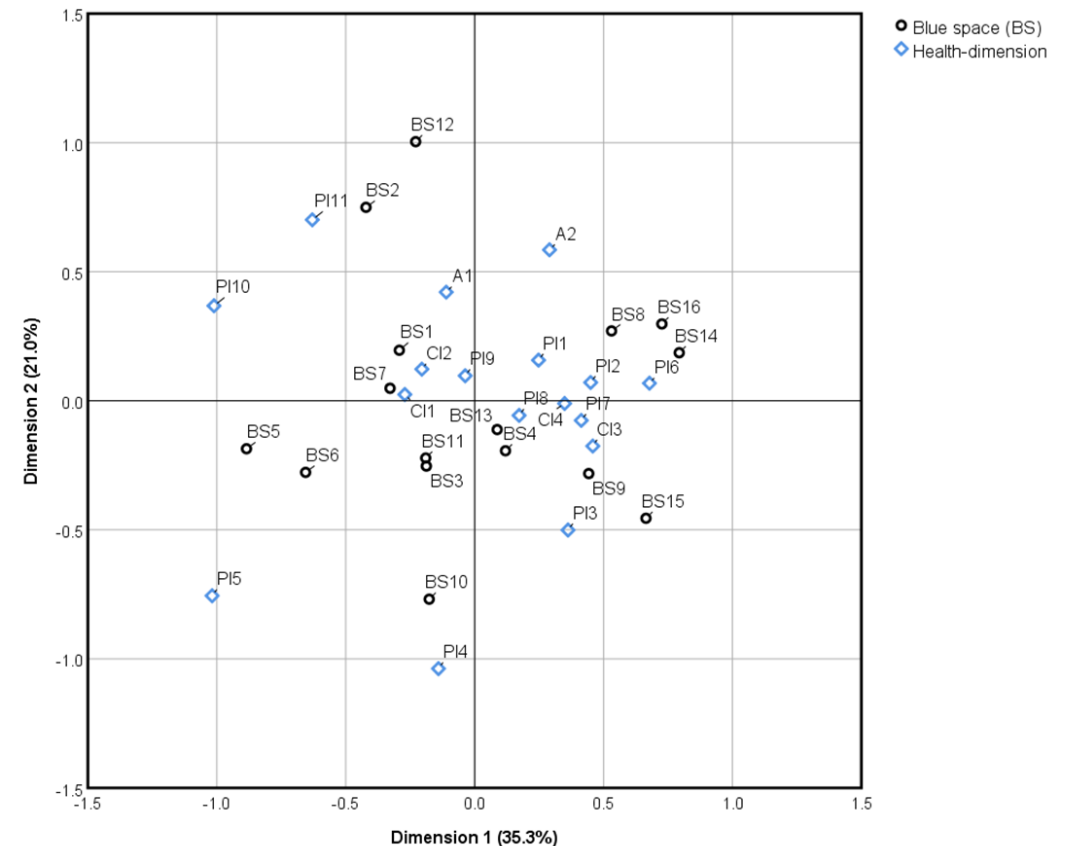
A before and after assessment of an blue space intervention

BEAT: Site Assessment and Analysis of Scores



Health-dimension	Health-dimension description (representing blue space attributes)	N	Min.	Max.	Mean (PCA Coefficients)	SD
Affordance						
S1	Condition of built and architectural elements.	16	0.300	1.000	0.606	0.202
S2	Sense of atmosphere.	16	0.300	0.900	0.663	0.159
S3	Built environment quality and feeling of tranquillity.	16	0.475	0.800	0.645	0.109
S4	Smell and noise pollution.	16	0.300	0.900	0.606	0.173
Ph1	Road and public transport.	16	0.333	1.000	0.800	0.185
Ph2	Car access and parking provision.	16	0.200	1.000	0.750	0.248
Ph5	Functionality of the paths and the use of material.	16	0.600	1.000	0.875	0.134
Affect						
A1	Water view and sense of openness	16	0.300	1.000	0.750	0.175
CI2	Absence of threatening stimuli.	16	0.600	1.000	0.850	0.137
CI4	Environmental safety and comfort conditions	16	0.277	0.908	0.690	0.161
PI3	Condition of car parking facilities	16	0.200	1.000	0.650	0.237
PI6	Visual aesthetics of the vegetation	16	0.400	1.000	0.725	0.229
PI7	Management of the vegetation and views within the site.	16	0.338	0.825	0.613	0.129
PI8	Environmental support for blind and partially sighted.	16	0.355	0.827	0.655	0.121
PI9	Management of hard surfaces and the absence of vandalism.	16	0.533	0.856	0.676	0.073

Descriptive statistics interpreting component health-dimensions extracted using Principal Component Analysis (PCA) that describe the underlying trait measured by blue space attributes.



Correspondence analysis can explore the association between place qualities and different health dimensions (i.e. affordance and affect)

BEAT: Site Assessment and Analysis of Scores for the Terrestrial Environment



Table 1. The point system for the assessment tool

Aspect	Status	Score Points	Standing waters	Running waters	Marine Environments
Substrate	Good	1	2	2	2
	Moderate	2	4	4	4
	Bad	3	6	6	6
Human impact	Good	1	29 – 47	30 – 50	31 – 52
	Moderate	2	48 – 67	51 – 70	53 – 74
	Bad	3	68 – 87	71 – 90	75 – 93
Ecosystem services	Good	1	16 – 26	16 – 26	21 – 35
	Moderate	2	27 – 37	27 – 37	36 – 50
	Bad	3	38 – 48	38 – 48	51 – 63
Biological and Ecological aspects	Good	1	19 – 31	10 – 16	12 – 19
	Moderate	2	32 – 44	17 – 23	20 – 28
	Bad	3	45 – 57	24 – 30	29 – 36

The total score will be the sum of score points of every aspect (Table 2).

Table 2. Scale for assessing the Ecological status of waterbody

Sum of Score points	Ecological Status of waterbody
4 – 5 points	Good status
6 – 9 points	Moderate status
10 – 12 points	Bad status

According to the example fillings of the tool, the status of a waterbody is:

Aspect	Status Score Points (SSP)
Substrate	2 (moderate)
Human impact	1 (good)
Ecosystem Services	1 (good)
Abiotic and Ecological	1 (good)
Sum of SSP (all four aspects)	5
Status of waterbody	GOOD

Methods to calculate aquatic ecosystem status

BEAT: Site Assessment and Analysis of Scores for the Aquatic Environment



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Thank You!
for Your Attention

Any questions?

