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BlueHealth is a pan-European research initiative investigating the links between environment, climate and health.

The programme is specifically focused on understanding how water-based environments in towns and cities can affect health and wellbeing.

It brings together experts from nine institutions and is funded by the European Union's Horizon 2020 programme.

MORE ABOUT BLUEHEALTH >

https://bluehealth2020.eu

Aim of BlueHealth Project

Quantify the impacts on population health and wellbeing of existing and novel interventions and policy initiatives connected to urban blue infrastructure, and to identify opportunities and obstacles from cross sectoral collaborations in this area.

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Describing " BlueHealth"

What do we mean by Bluespace?
Within the scope of "BlueHealth" we define bluespaces as outdoor environment – either natural, or manmade- that prominently feature water and are accessible to human, either proximally (being in, on, or near water) or distally or virtually, (being able to see, hear, or otherwise sense water). (Grellier et al., 2017)

Mounting evidence suggest that interacting with nature or nature-based solutions in urban area can have positive effects for physical health and mental well-being.

So, the focus here is to investigate…. how do blue environments specially provide us Health and wellbeing benefits?

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Describing " BlueHealth"

- Bluehealth takes an international and innovative, multi-disciplinary and cross sectoral approach to health promotion and disease prevention.
- Blue Infrastructure is key to EU's Health in all policy agenda.
- Involves detailed and systematic consideration of the blue infrastructure interventions.
- Using several **case study** sites across Europe, to explore the varying geographical, climatic, cultural and environmental conditions and also challenges at individual level through community to population level.
- Integration urban blue infrastructure into spatial planning design and local policies
- Crucial to understand "**bluespace environmental types and quality**"

Two out of many other specific objectives of BlueHealth relevant to BEAT

- Develop innovative methodologies (including quantitative and qualitative indicators) for assessing the opportunities and challenges of health from blue infrastructure, while also considering their economic, environmental and equity related implications.
- Assess and evaluate specific blue infrastructure case study interventions in a range of setting (e.g. coastal environment or care homes), cultural, climatic context, and incorporating innovative technologies where appropriate such as virtual reality

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BlueHealth: Concepts and approaches

- Blue infrastructure can directly or indirectly promote health and prevent disease,
- There is a clear (however yet to be explored) mechanism and pathway appears to play a major role in achieving these benefits
- Coastal or inland waterbodies, are prime locations for leisure and tourism, homes or hotels with water views are significantly more expensive.

Source: http://www.landezine.com/index.php/landscapes/landscape-architecture/realized-projects/waterfront

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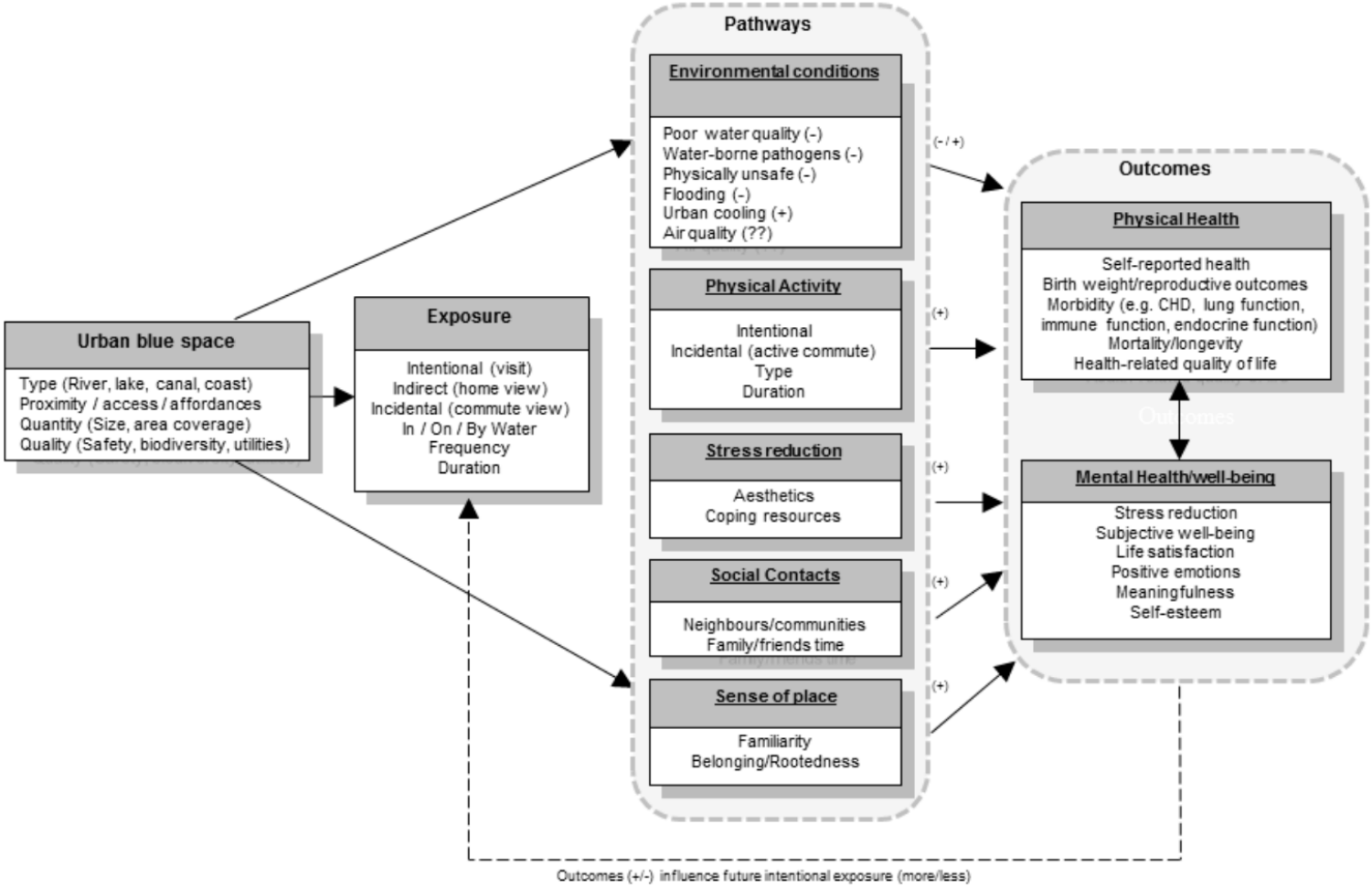

Source: BlueHealth project Report, 2015

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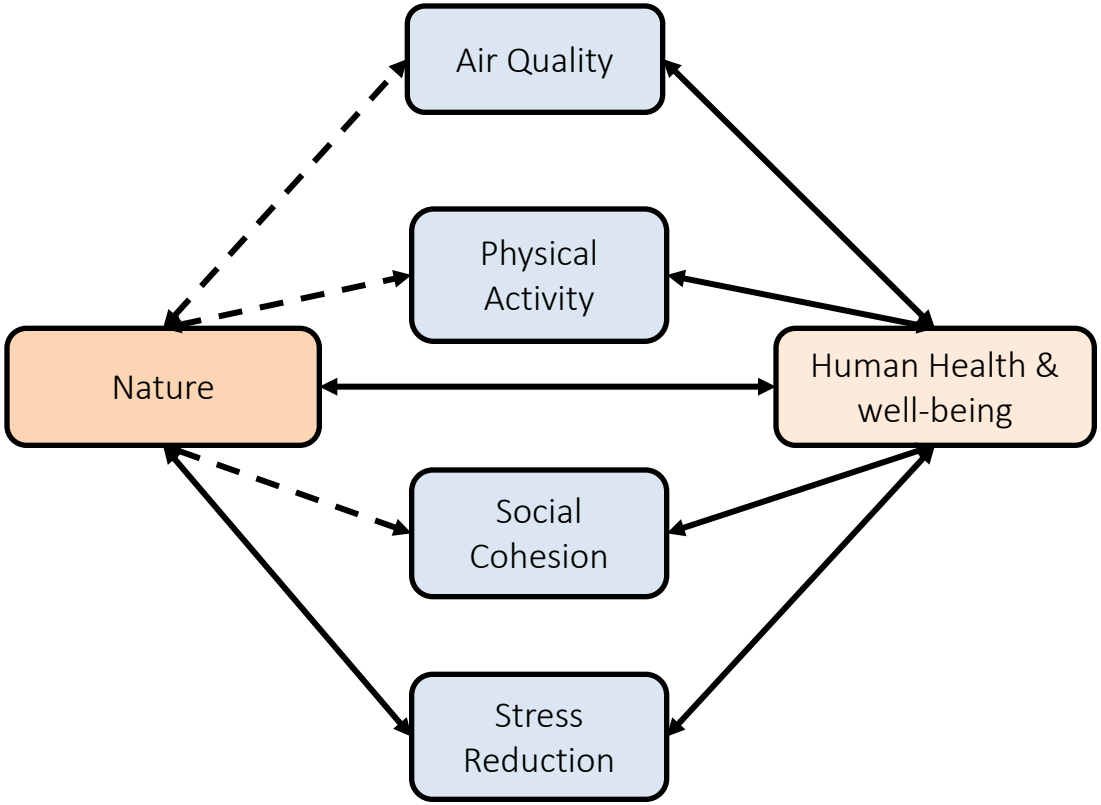

Schematic representation of relationships among mature, health, and underlying Mechanism. Solid lines represent established relationship and dashed lines represent weak and inconsistent relationship

Steg et al. 2013, Health Benefits of Nature, Environmental Psychology An Introduction, p. 53

Exposure is an important mechanism that establishes the relationship between nature and health.

1. **Intentional** (deliberately vising bluespace)
2. **Indirect** (from window)
3. **Incidental** (visual exposure during a commute)

Keniger et al. 2013, What are the benefits of interacting with nature? Environmental Research and Public Health, 10, 913-935

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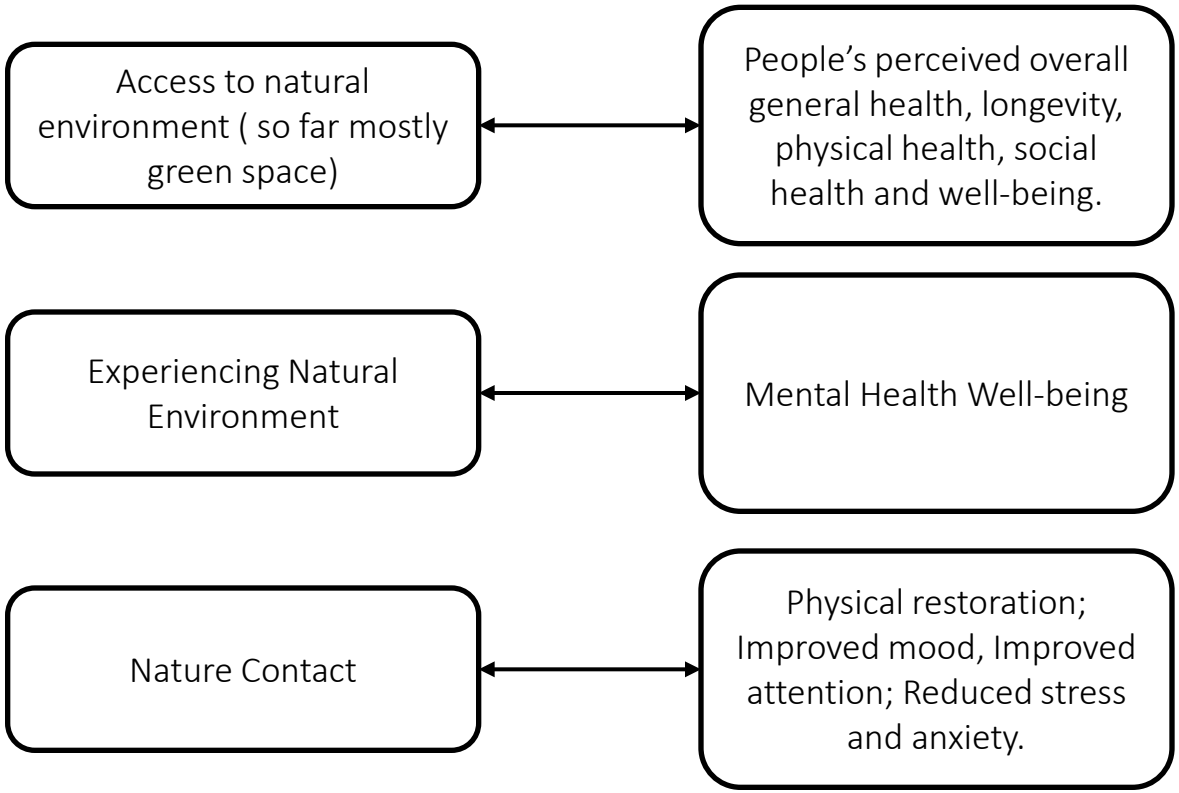
Salutogenic Benefits of Bluespace



There are tested theories support this argument….

- Biophilia hypothesis (Wilson, 1984)
- Stress Reduction Theory (Ulrich, 1984)
- Attention Restoration Theory (Kaplan & Kaplan, 1989)
- Salutogenic Model (Antonovsky, 1996)

Scientific principles and theoretical grounding and already established theories that provide substantial positive relationship between Nature and Health

Source: The James Hutton Institute, Centre for Expertise for Water (CREW), BlueHealth: Water, Health and Well-being

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Bluespace Affordances, setting and health and well-being: Evidence from literature

Preferences for water setting:

Sea-side environment, presence of water, views of the bluespaces, colour, climate or weather conditions, aesthetic, visual quality of the surrounding landscape and views to and from within, soundscape, choice of place of live

Salutogenic health process of urban blue spaces

- Experience space- sensory perception, aesthetic experience, association, image
- Symbolic space- Symbols, signs, icons, tokens, emotion, identity, sense of place
- Social space- relative equality, social relation, social activity
- Activity space- activities, connections, context

(Volker, 2015)

Impact of bluespace on human health and wellbeing: Perception and preference Indicators

- Perception and preference Indicators. i.e costal vegetation, water views, humidity etc.
- Landscape design indicators. i.e. naturalness and spaciousness, design with water etc.
- Emotional benefit indicator. i.e. tranquillity, attention, interest, fascination etc.
- Restoration and recreational benefit indicators. i.e. diversity in blue space, experience (recreation and aesthetic) etc.
- Direct Health benefits indicators. i.e. extent of water views, water edge conditions etc.

(Volker and Kistemann, 2011)

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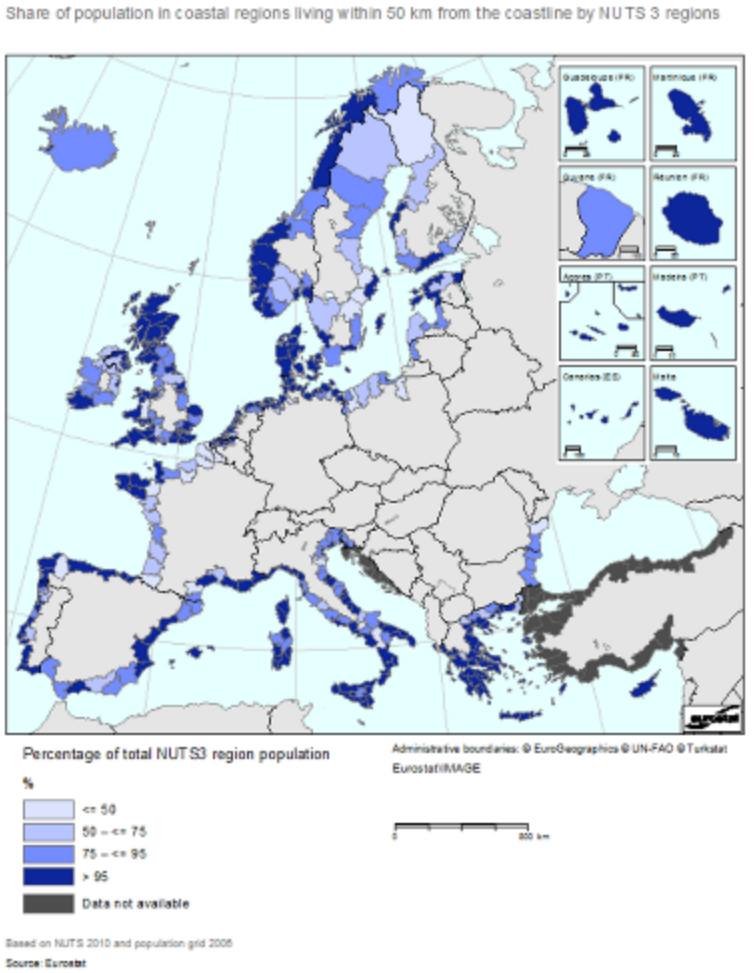
Research Gap

- Most of bluespace research has been conducted in the UK and Germany
- Traditional epidemiological research has so far ben enable to unpick the precise factors associated with blue infrastructure intervention that promote health and prevent disease
- Gender, age related differences yet to be investigated
- Challenges of health and environmental equity
- Health related implications of climate change on our urban blue infrastructure



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Development of Bluehealth Environmental Assessment Tool (BEAT)

- BEAT has been developed as part of planning and design of blue spaces;
- Evaluates a place in a holistic way, through integrating a number of domains (such as the social, physical or ecological);
- Designed primarily for identifying the extent to which a particular blue space provides opportunities for obtaining exposure to water;
- BEAT is for team of experts and Local communities or citizen groups
- Elements of tool are objective and measurable on site and can be administered by single person;
- The tool has been developed based on a systematic review using 39 existing place or space assessment tools from diverse disciplines i.e. Community planning, urban planning, public health, transport planning, urban design and place making, sustainability, environmental management etc.

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When reviewing each tool, we considered the following aspects:

- 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

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Basic Description of Bluehealth Environmental Assessment Tool (BEAT)

- A simple scoring system either categorical rating (1-5) or present or absent.
- comparison can be made between different sites or for the same site at different time points.
- The tools reviewed helped in clarifying and determining the domains for BEAT;
- Each domain then subdivided into several factors or criteria, assessed separately and then summarised to give a score for the entire domain.
- Tool has been divided into Four steps

  Step1: **Preliminary Data about the site**
  Step2: **General Site Description**
  Step3: **On site Survey (terrestrial)**
  Step4: **Water Ecosystem Assessment**

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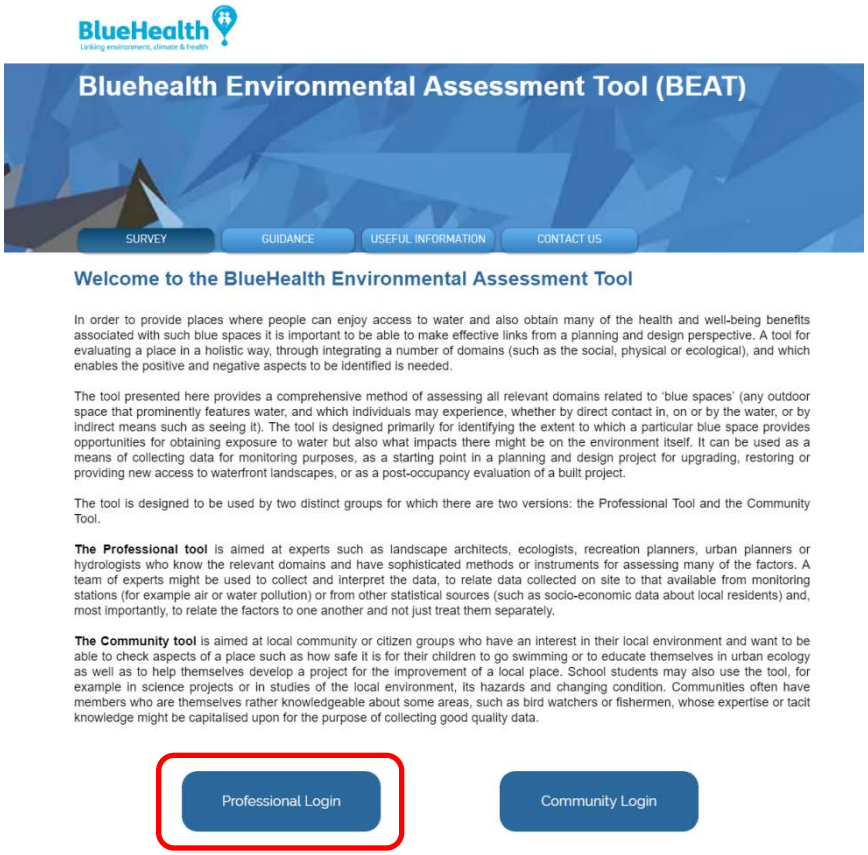
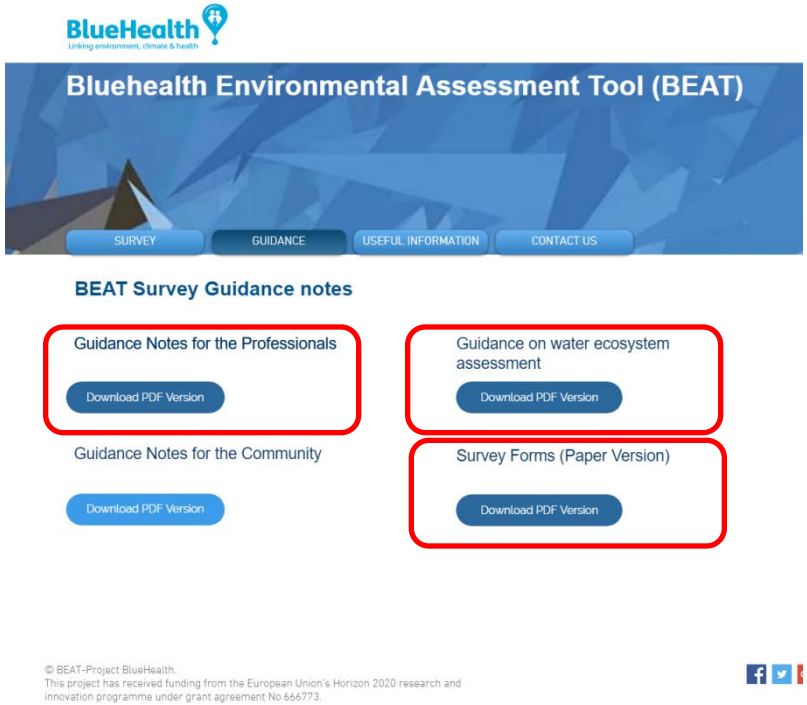
BEAT: Online Survey Tool https://beatbluehealth.wixsite.com/site



Survey page



Guidance page

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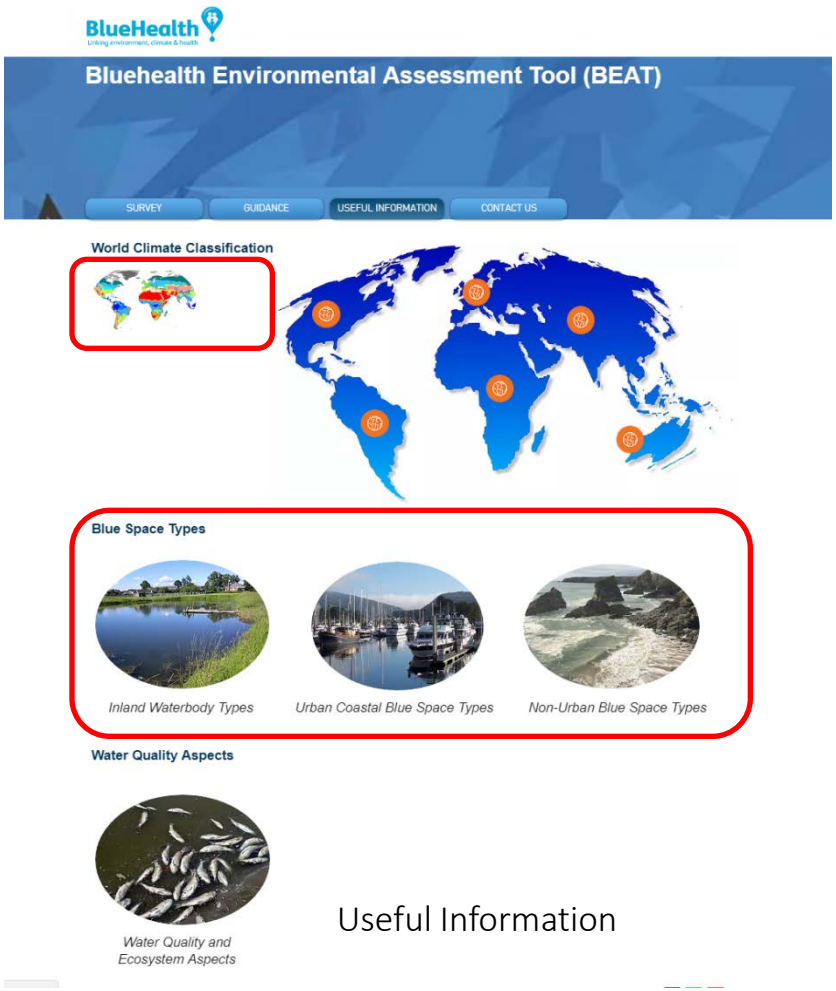
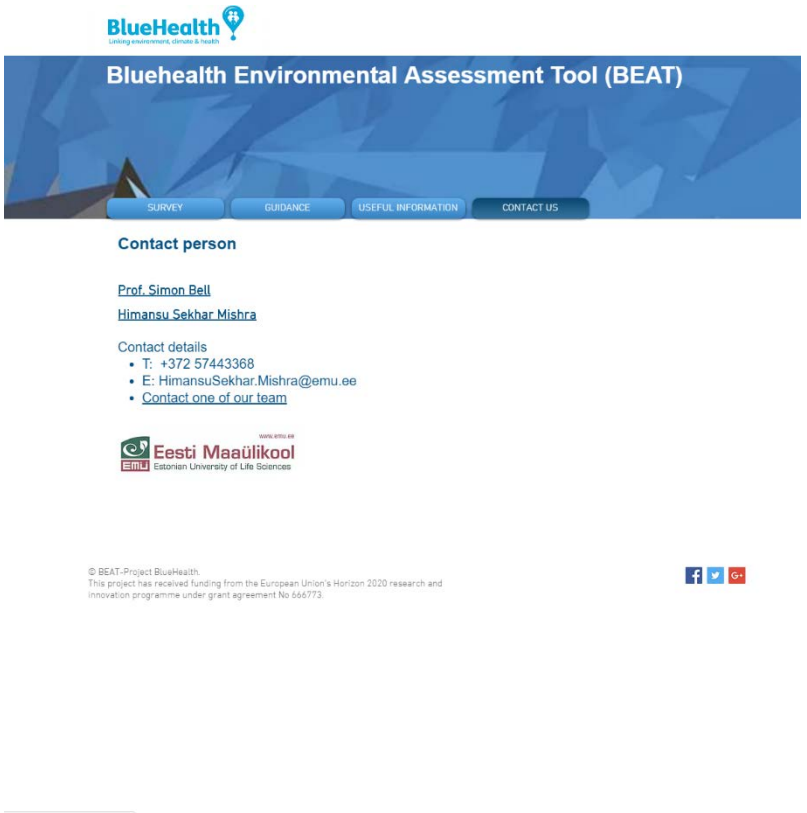
BEAT: Online Survey Tool https://beatbluehealth.wixsite.com/site



Useful Information



Contact

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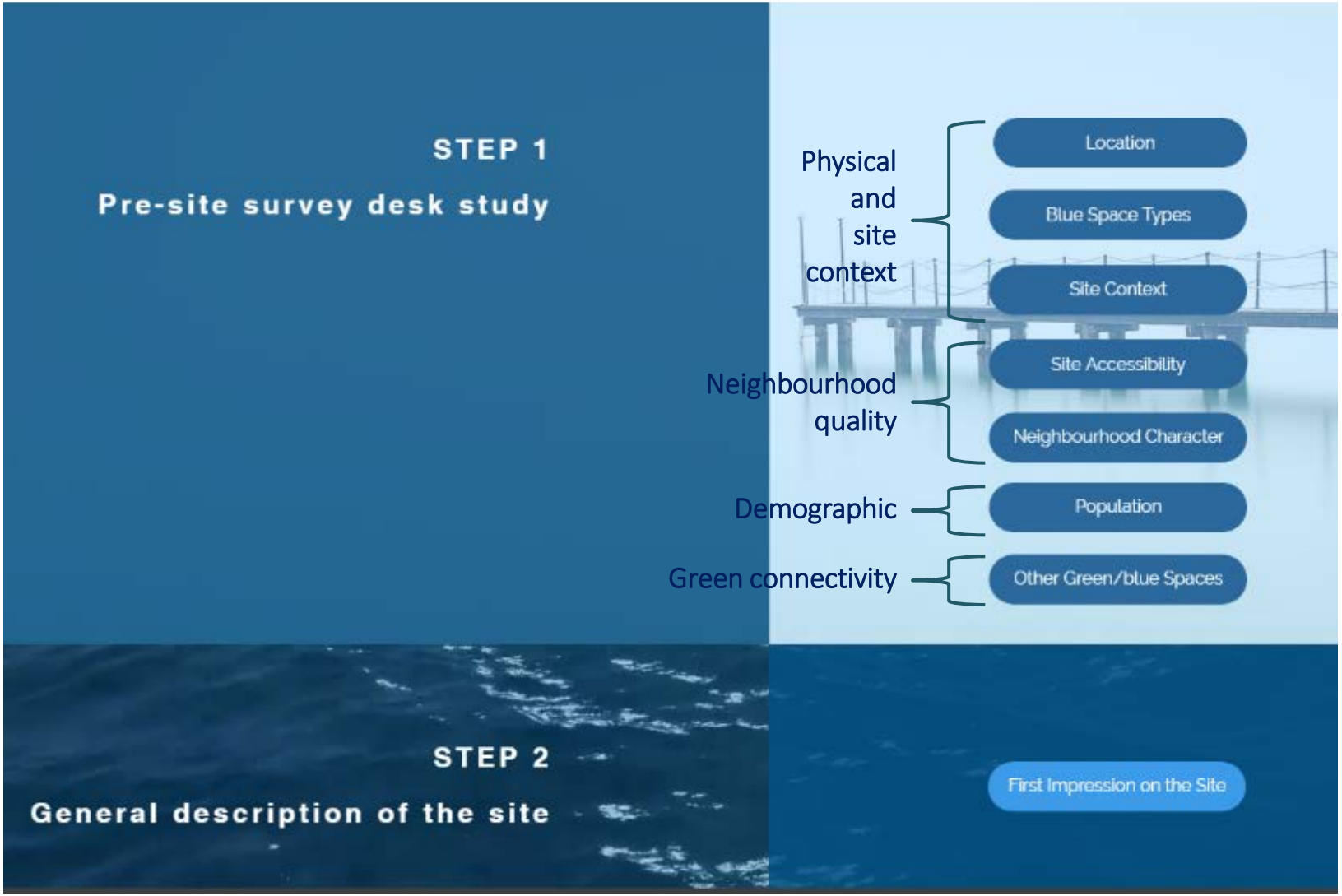

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STEP 3

The Site Survey

1.Accessibility
2.Care, Maintenance and Management
3.Facilities and Amenities
4.Environmental- Quality/ Place Quality/ Landscape feature and quality
5.Safety Security
6.Use/ User, Place- Interaction (Activities)
7.Community / Sense of Community / Social
8.Space Design Aspects
9.Cultural and Natural Heritage
10.Sustainability Measures
11.Hydrology
12.Education
13.Local Governance
14.Marketing
15.Property Value

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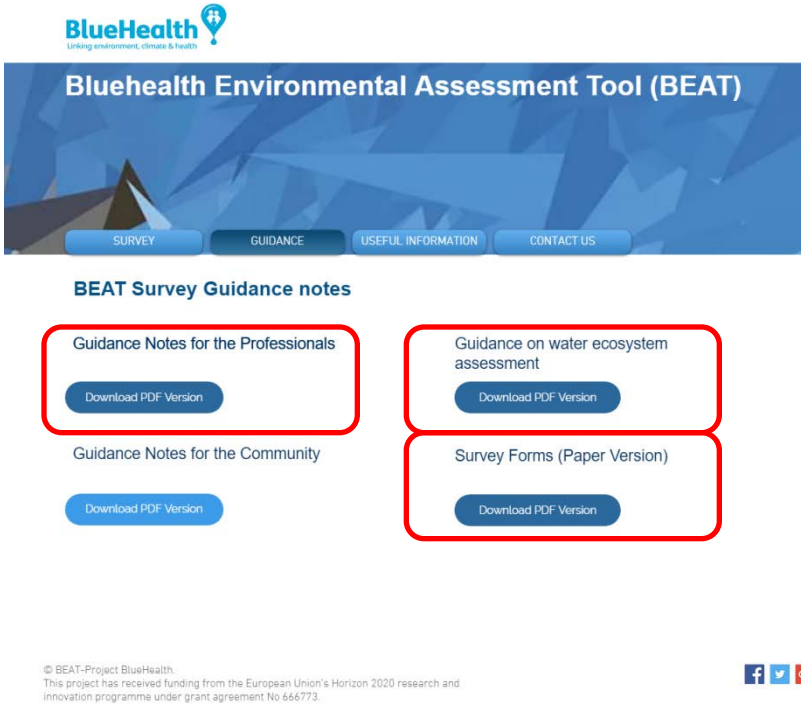
BEAT: Guidance for the Terrestrial and Water Ecosystem Assessment



Guidance page

- Guidance documents assist how to complete the assessment and what specific factors should be looked at when evaluating each domain and aspects.
- Each assessment should be completed by at least two surveyors acting independently and their scores agreed or averaged.
- Surveyors should practice the assessment and, receive 2 hrs. of training.
- BEAT is applied via the web-interface which can be used on a laptop, tablet or smartphone, also using paper forms that available to download, and data may be entered later after the completion of the survey.
- Post- intervention, 3rd step may be repeated, in order to record changes and establish if the intervention met its objectives.

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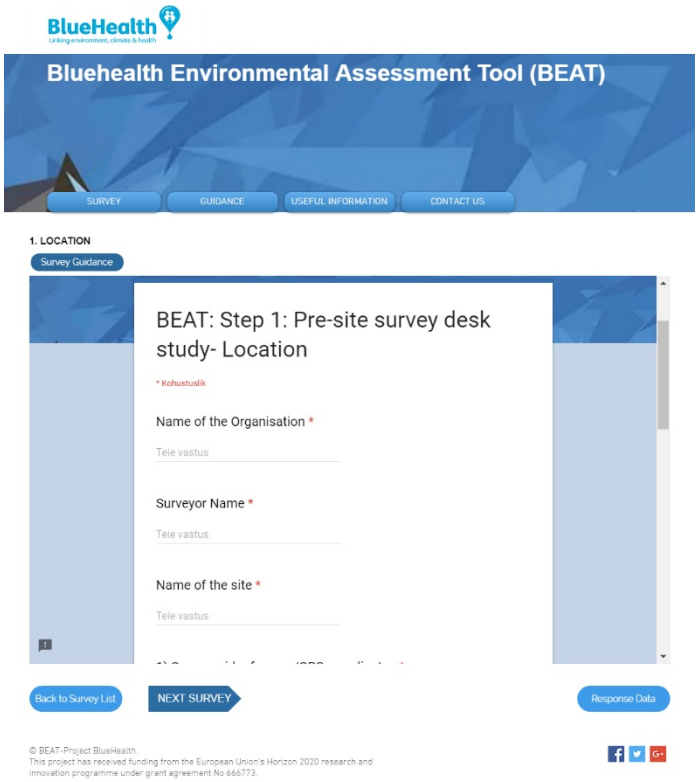
BEAT: Step 1: Pre-site survey desk study

1. Location
2. Name of site, survey grid reference/GPS coordinates, area (ha)/length (m or km)
3. Blue space type(s) (according to the list as used in the BlueHealth International Survey)
4. Climatic zone and climate trends
5. Site Context
6. Brief description of the site, its current uses and general setting
7. Historical information about the site
8. Nature protection status, if any (Natura 2000 etc)
9. Symbolism and memory associated with the area if available (may be more for local community groups)

10. General description of the surrounding landscape and setting (built form, natural elements etc.)
11. General description of the waterbody and its wider connectivity in the hydrological system
12. Accessibility to the site (terrestrial and water-borne)
13. Residential character of the neighbourhood
14. Property types and ownership, population, socio-economic status, etc.
15. Other green/blue spaces within 100m, 500m, 1km
16. Tourism and recreational infrastructure and attractions within 1km of the site



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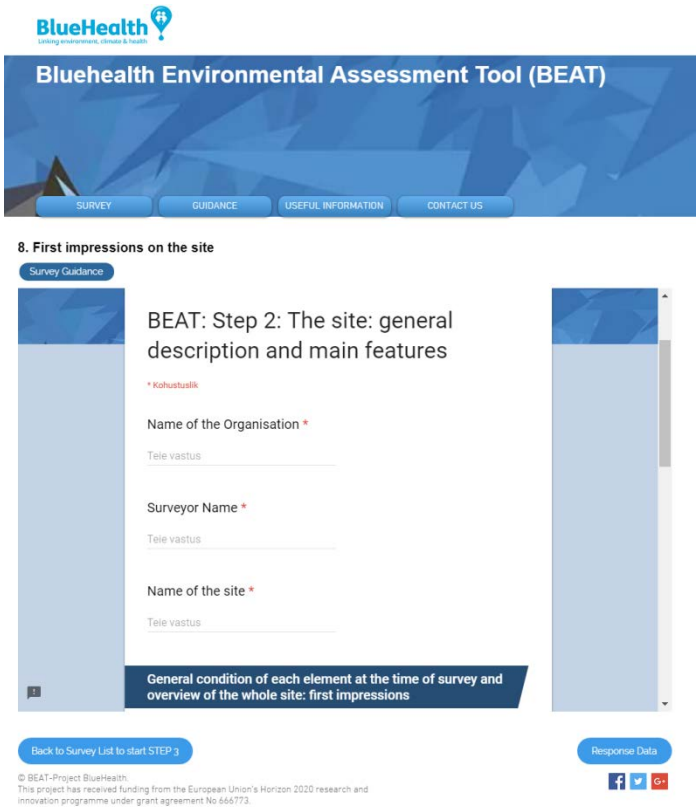
BEAT: Step 2: General Description of the Site

1. Water type (fresh/salt/brackish)
2. Tidal character (if tidal, what is range)
3. Water depth (cross section showing profiles at different points)
4. Currents (undertows etc.)
5. Flood characteristics
6. Riparian/water margin structure (slopes, embankments etc.)
7. Edges (trees, reeds, shingle, sand, concrete walls etc.)
8. Terrestrial land cover (grass, woodland, hard surfaced etc.)
9. Paths and facilities within the site (benches, water access features etc.)
10. Condition and activities at the time of survey
11. General condition of each element at the time of survey and overview of the whole site: first impressions.

This section is mainly descriptive and should be accompanied by the map and also photographs.



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BEAT: Step 2: Onsite survey preparation

BH Case study Site: Besos River Montcada, Barcelona

BH Case study Site: City park Guimareas, Portugal

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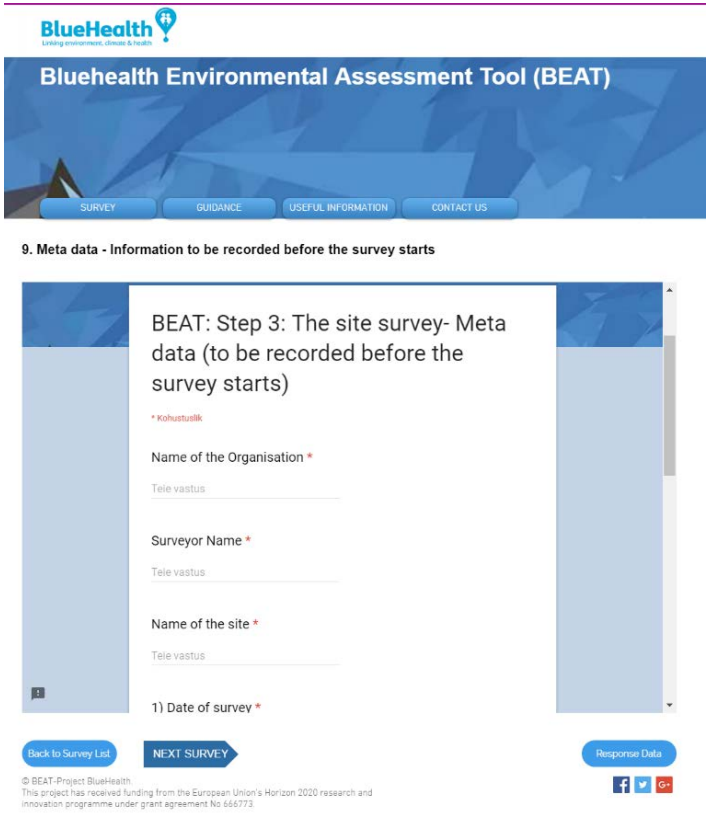
BEAT: Step 3: The On-Site Survey

Social domain
- Aspect 1: Use of the site
- Aspect 2: Information and educational aspects
- Aspect 3 Safety and security

Aesthetic domain
- Aspect 1: Visual condition of the surroundings of the site
- Aspect 2: Visual quality of the site
- Aspect 3 Non-visual aesthetic aspects

Physical domain
- Aspect 1: Access and circulation within the site
- Aspect 2 Accessibility for disabled people
- Aspect 3: Terrestrial recreation structures (visual quality, functionality, condition)
- Aspect 4: Water access and recreational structures (visual quality functionality, condition)
- Aspect 5: Management and maintenance

Agreement on final score



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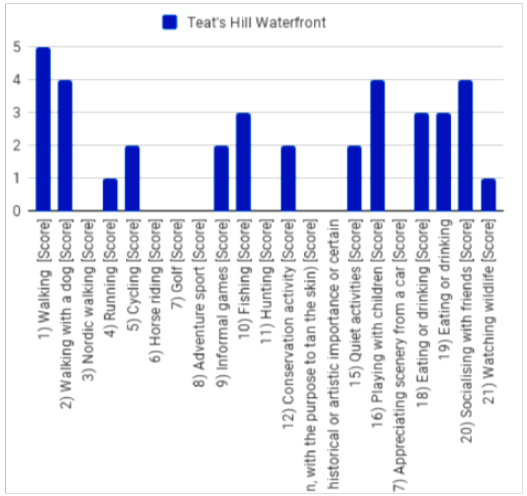
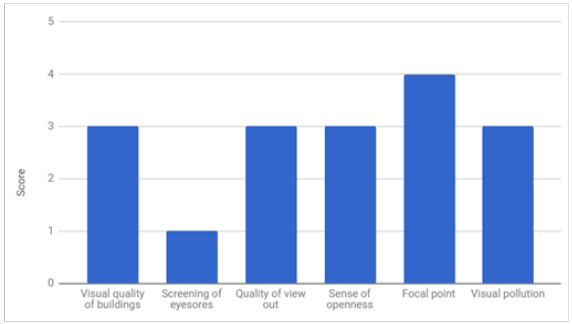
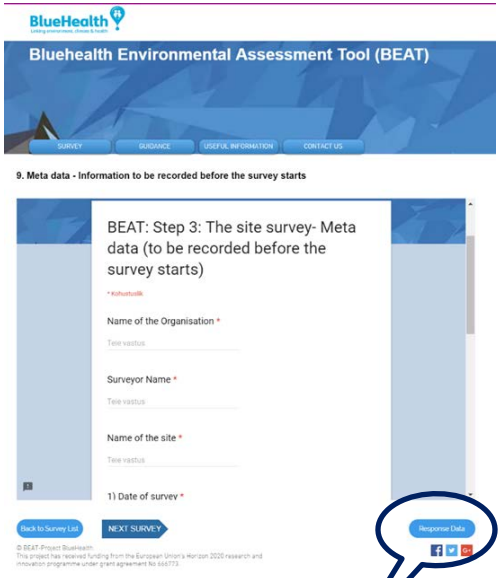
BEAT: Step 3: Results

Activities within Bluespace



Visual Conditions





Safety and Security

Visual Quality

Click the Response data button to get the results

https://docs.google.com/spreadsheets/d/1M7GRm5GUCAvb7Nlkq7JtK2m7WAnY4jQc7pnVWUJxmoY/edit#gid=1334112792

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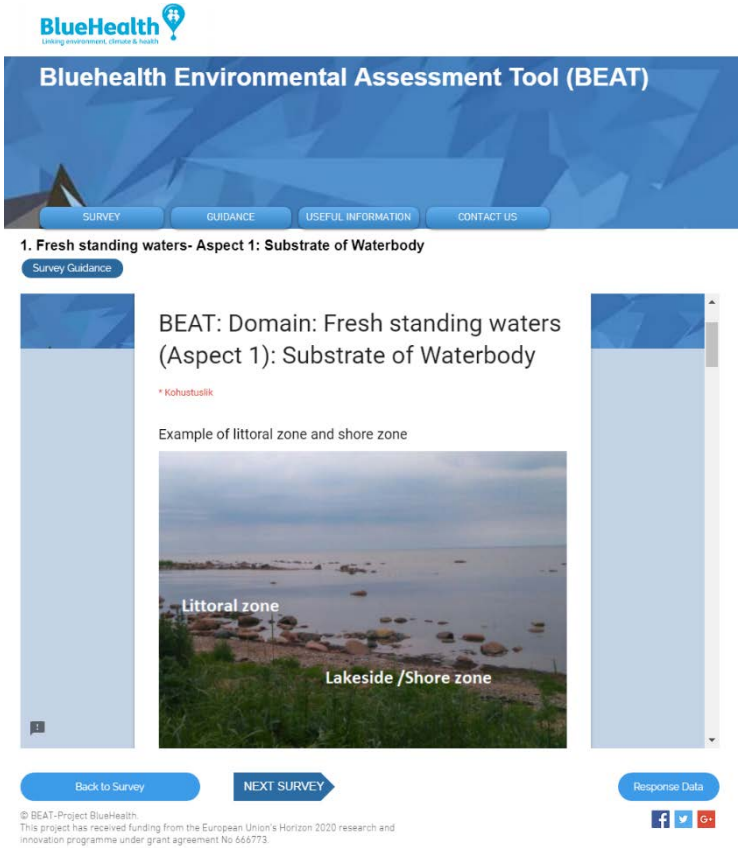
BEAT: Step 4: Water Ecosystem Assessment

Running water
- Aspect 1: Substrate of the waterbody
- Aspect 2: Human impact
- Aspect 3: Ecosystem services
- Aspect 4: Abiotic and Ecological aspects

Standing Water
- Aspect 1: Substrate of the waterbody
- Aspect 2: Human impact
- Aspect 3: Ecosystem services
- Aspect 4: Abiotic and Ecological aspects

Marine Environment
- Aspect 1: Substrate of the waterbody
- Aspect 2: Human impact
- Aspect 3: Ecosystem services
- Aspect 4: Abiotic and Ecological aspects



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BEAT: Step 4: Water Ecosystem Assessment

STEP 1: Choose the type of water domain

Please choose the correct type of domain (Figure 1):

A. Standing waters - lakes, ponds, and pools of natural origin containing fresh (i.e. non-saline), brackish or salt water. Manmade freshwater bodies, including artificially created lakes and reservoirs, provided that they contain semi-natural aquatic communities.

B. Running waters - running waters, including springs, streams, rivers, canals and temporary water courses.

C. Marine ecosystems – Marine habitats are directly connected to the oceans, i.e. part of the continuous body of water which covers the greater part of the earth's surface and which surrounds its land masses. Marine waters may be fully saline, brackish or almost fresh. Marine habitats include those below spring high tide limit (or below mean water level in non-tidal waters) and enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with the intermittent surface or sub-surface connections (as in lagoons).

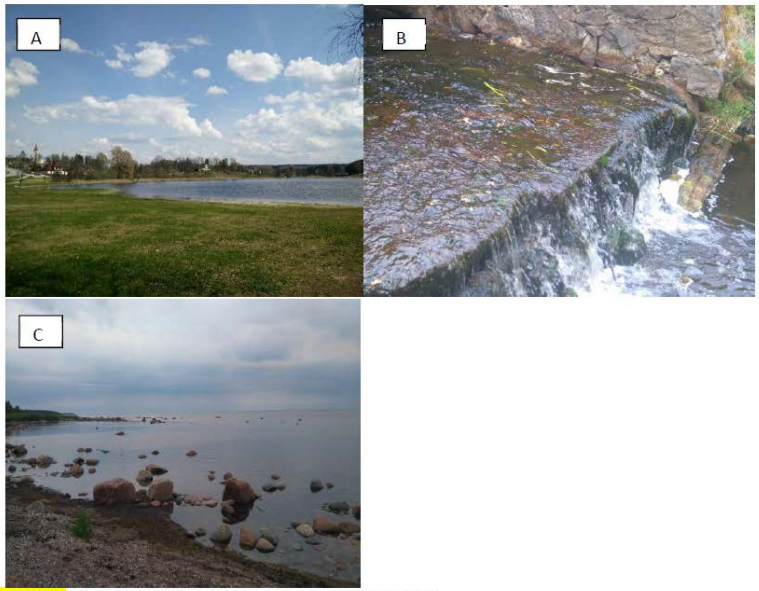

Figure 1. The three water domains for assessment tool.

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	1 or 2 or 3
	Bad	3	6	6	6	
Human impact	Good	1	29 – 47	30 – 50	31 – 52	
	Moderate	2	48 – 67	51 – 70	53 – 74	1 or 2 or 3
	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	1 or 2 or 3
	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	1 or 2 or 3
	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

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Substrate Assessment

An example of the correct filling of the tool can be:

If the „blue" substrate is the main substrate, it will get always 1 point. If the „red" substrate is dominating, it reflects high human impact and will get always 3 points.

Shore zone main substrate	
Substrate	*Points*
Rocky	0
Gravel	0
Sandy	0
Plants	0
Peat	0
Clay	0
Muddy sand	0
Mud	0
Artificial (Concrete et al.)	3

Littoral zone main substrate	
Substrate	*Points*
Rocky	1
Gravel	0
Sandy	0
Plants	0
Peat	0
Clay	0
Muddy sand	0
Mud	0
Artificial (Concrete et al.)	0

The sum of points (4) indicates that there are moderate human impact and some modifications at the shore, but not in the waterbody itself. **The status of Substrate is moderate** and this corresponds to Status Score Point **(SSP) 2** (moderate).

Figure 3. The two main zones, where substrate must be assessed.

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
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Human Impact Assessment

STEP 2: Assessing the human impact

Please evaluate every indicator, which represents human impact to the waterbody at the scale:

- 1 point if the indicator is not present at the site
- 2 points if the indicator is nearby of the site (200 – 1000 meters)
- 3 points if the indicator is at the site (perimeter up to 200 meters)

Some of the indicators (Figure 4) represent potential sources (e.g. tourism objects, waste, and rainwater discharge points) and most of them potential diffuse pollution sources. These indicators reflect a different type of disturbances indicated by human activity which could affect ecosystem ecological status negatively. Lower scores mean the better ecological status of the waterbody.

Figure 4. Some examples of negative human impact on waterbodies.

Note: To assess these indicators of human impact, the map of the waterbody could give additional information.

Please evaluate **only the presence** of these human impact indicators. **You do not have to assess the whole range of the impact of these indicators.**

An example of the correct filling of the tool can be:

Indicator	Score
Housings	2
Buildings	2
Industrial buildings	1
Agricultural buildings	1
Agricultural land	1
Maintained grassland and lawn area	1
Pastureland	1
Garden land	2
Loading of shore/beach area by filling earth	2
Road area	3
Parking area	1
Railway	1
Minings	1
Sediment removal	1
Cutting plants from lake	1
Park	2
Beach	2
Tourism objects	3
Piers and bridges	3
Boats	1
Boat channels	1
Artificial shore protections	1
Dam	2
Dyke/Wier	1
Landfill	1
Trash or litter	1
Pollution	2
Artificial objects in the water	1
Waste and rainwater discharge points	1

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
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	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

The sum of points (43) indicates that there is small human impact and there is few or no diffuse or point pollution sources and this should not affect the status of waterbody negatively. The status of Human impact aspect is good and this corresponds to **1 SSP** (Status Score Points).

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Ecosystem Services Assessment

Service (Good)	Explanation
Potential of using reed (Phragmites sp.) as a material	With carrying the reed out from the waterbody, people carrying off the potential phosphorus, nitrogen and organic matter within
Inflow(s) are present	Inflows and outflows increase the water exchange of waterbody and will make it more stable against pollution and human impact
Outflow(s) are present	
Endangered species are present (flora and fauna)	Endangered species reflect the good status of water chemistry, substrate, and balanced food webs because usually, the endangered species are sensitive to different types of disturbances in waterbody (e.g. turbid water, increasing biogen levels, algal blooms, anoxic conditions)
Protection areas are present	Protection areas are created to preserve some concrete landscape, ecosystem or species habitat, therefore this should affect the waterbody positively.
Bluespace is safe for swimming	Safety for swimmers reflects the good condition of the shore and littoral zone (no trash, broken bottles etc.). Under this service, we also consider that the microbiological parameters are at good (allowed) levels and no harmful algal blooms.
Crayfish catching opportunities	Crayfish is sensitive to changes in water quality and this species is quite rare, therefore it reflects the good status of the waterbody.

To assess the good services (5 indicators: the presence of marine protection areas, natural sediments (not artificial), the presence of tides, removal of contaminated sediments and safety for swimming), the assessment scale is:

- 1 point – service is present or provided at the evaluation site
- 2 points – service is present or provided nearby the evaluation site (200 meters)
- 3 points – service is not present or provided at the evaluation site or nearby

Indicators (Bad)

Using water for drinking purposes	Additional water abstraction makes waterbody more unstable and more sensitive to the human impact and pollution.
Using water for other purposes	
Using mud from waterbody	Pumping or digging or using other methods to collect the mud from the waterbody disturbes stratification and could affect water transparency and therefore influences the stability of the ecosystem.
Fish stock	The presence of the fish stock encourages fishing from the waterbody. Humans usually prefer to catch predatory fishes, which affect the balance of predatory and prey fishes.
Fishing opportunities	
Visible algal bloom are present	Visible algal blooms indicate the additional nutrients that are available for phytoplankton blooms to form biomass.
Opportunity of regulating water level	Regulating the water level will block the natural water flow and collects additional sediments behind the dam.
Constructions for flood protection are present	Every additional construction at the shore or in the water changes the natural shore and could affect waterbody negatively.
Existence of infrastructure	Potential pollution source for the waterbody. Increases number of people who uses water for recreational purposes.

Assessing the potentially „bad services" (Sixteen indicators: presence of commercial fishing, presence of wind turbines, production of hydrothermal energy, other energy production ways present, presence of ice roads, presence of ramps or small harbours, presence of transit ports, presence of shipping routes, significantly modified seafloor, signs of erosion, presence of artificial coastal structures, presence of point source pollution, signs of diffuse pollution, signs of wastewater discharge to the sea, recreational constructions and presence of leisure fishing and hunting) one have to consider that:

- 1 point – service is not present or provided at the evaluation site or nearby
- 2 points – service is present or provided nearby the evaluation site (200 meters)
- 3 points – service is present or provided at the evaluation site

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Ecosystem Services Assessment

An example of the correct filling of the tool can be:

Indicator/Service	Score 1-present; 2-present nearby; 3-not present
Potential of using reed (*Phragmites* sp.) as a material	1
Inflow(s) are present	1
Outflow(s) are present	1
Endangered species are present (fauna and flora)	3
Protection areas are present	1
Bluespace is safe for swimming	2
Predatory fish catching opportunities	2

Indicator	Score 1-not present; 2-present nearby; 3-present
Using water for drinking purposes	3
Using water for other purposes than drinking (cooling water, industrial water et al.)	1
Using mud from blue space (for purposes of mud therapy and agriculture) substantially	1
Commercial fishing	1
Production of hydrothermal energy	1
Visible algal bloom are present	2
Water level regulation	1
Constructions for flood protection are present	1
Existence of infrastructure and presence of recreational service providers	1
Fishing opportunities	2

The sum of points (25) indicates that there is small human impact and there is few or no diffuse or point pollution sources and this should not affect the status of waterbody negatively. The status of Ecosystem services aspect is good and this corresponds to **1 SSP** (Status Score Points).

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

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Biological and Ecological Assessment

An example of the correct filling of the tool should be:

d) Biological and Ecological indicators

Indicator	Score (1- not present; 2-present nearby; 3-present at site)
Domination of emergent plants	1
Domination of floating and floating-leaved plants	1
Invasive species present	2
Plants covered with slimy substance (periphyton)	1
Floating filamentous algae	1
Dead fish at the shore	2
Presence of waterfowl	2

Indicator	Score (1- present at site; 2- present nearby; 3-not present)
Domination of submerged plants	1
Presence of amphibians	3
Presence of fishes	1
Presence of aquatic mammals	3
Presence of mussels (including snails)	1
Presence of aquatic insects	1
Microbiological parameters (FIB and PIB - fecal indicator bacteria and pathogen indicator bacteria parameters) are in good level	2

The sum of points (28) indicates that there is small human impact and there is few or no diffuse or point pollution sources and this should not affect the status of waterbody negatively. The status of Abiotic and Ecological aspects is good and this corresponds to **1 SSP** (Status Score Points).

able 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
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	Moderate	2	27 – 37	27 – 37	36 – 50
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able 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

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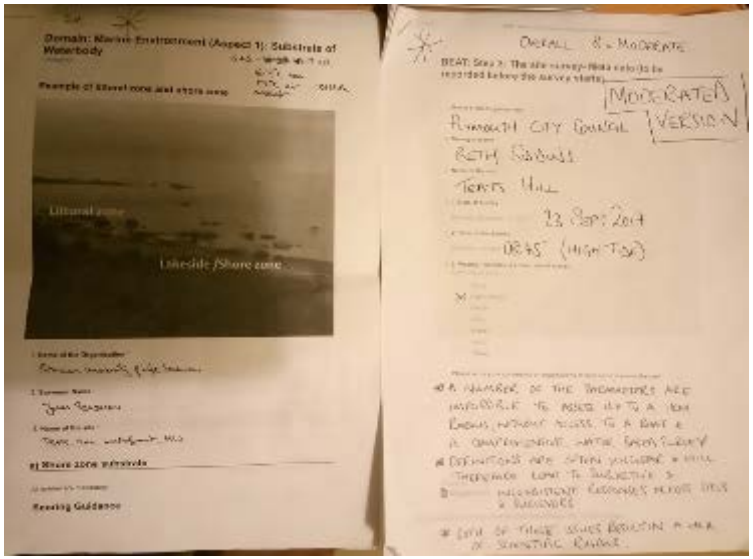
State of the Aquatic Environment

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**



Agreement on final score

Data and Results

https://docs.google.com/spreadsheets/d/1S8aHYtPf6H0PK-NcPw3zu-zeAT1GirsTi4bQzEQT2zQ/edit#gid=1358244652

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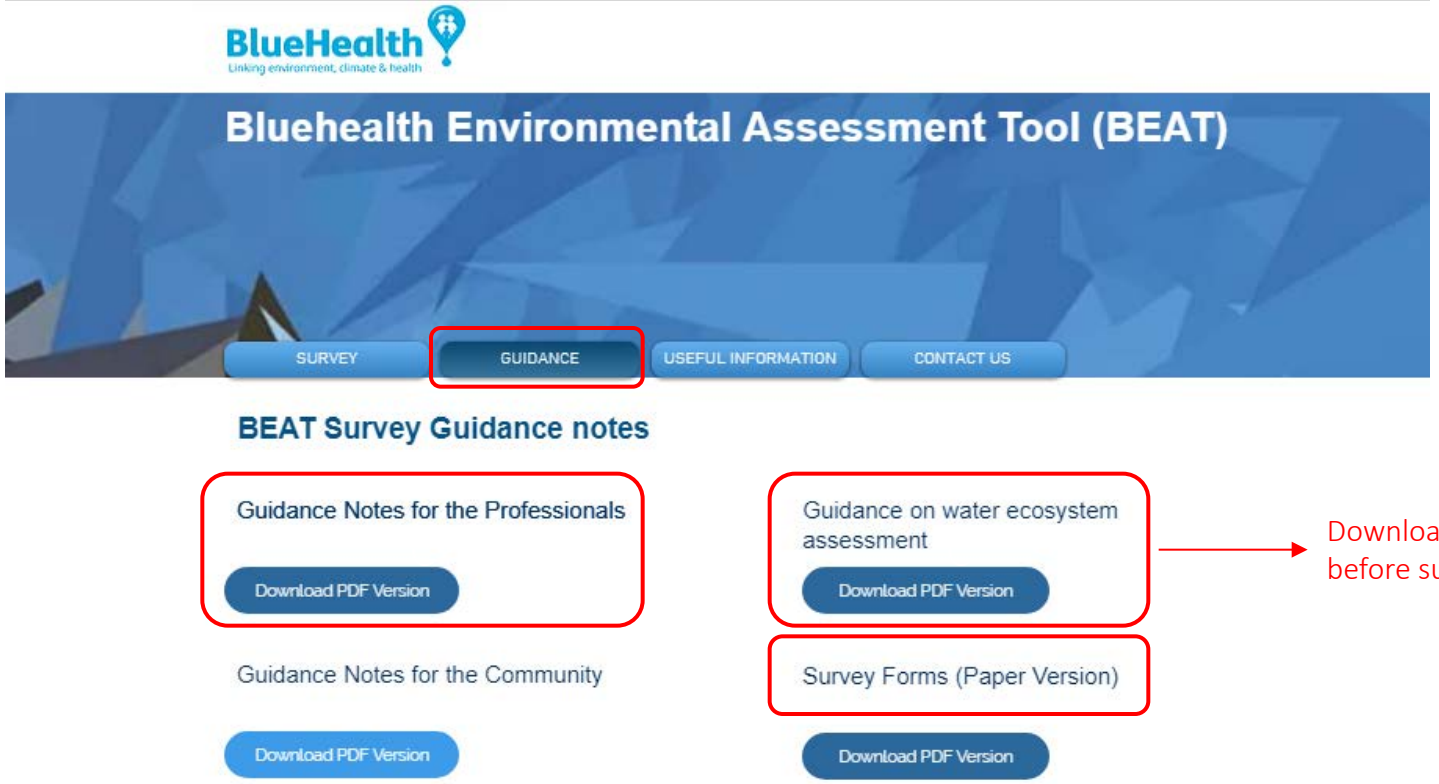
BEAT: Step 3: Survey forms for Terrestrial and Water Ecosystem assessment and practical information



Download and read before survey

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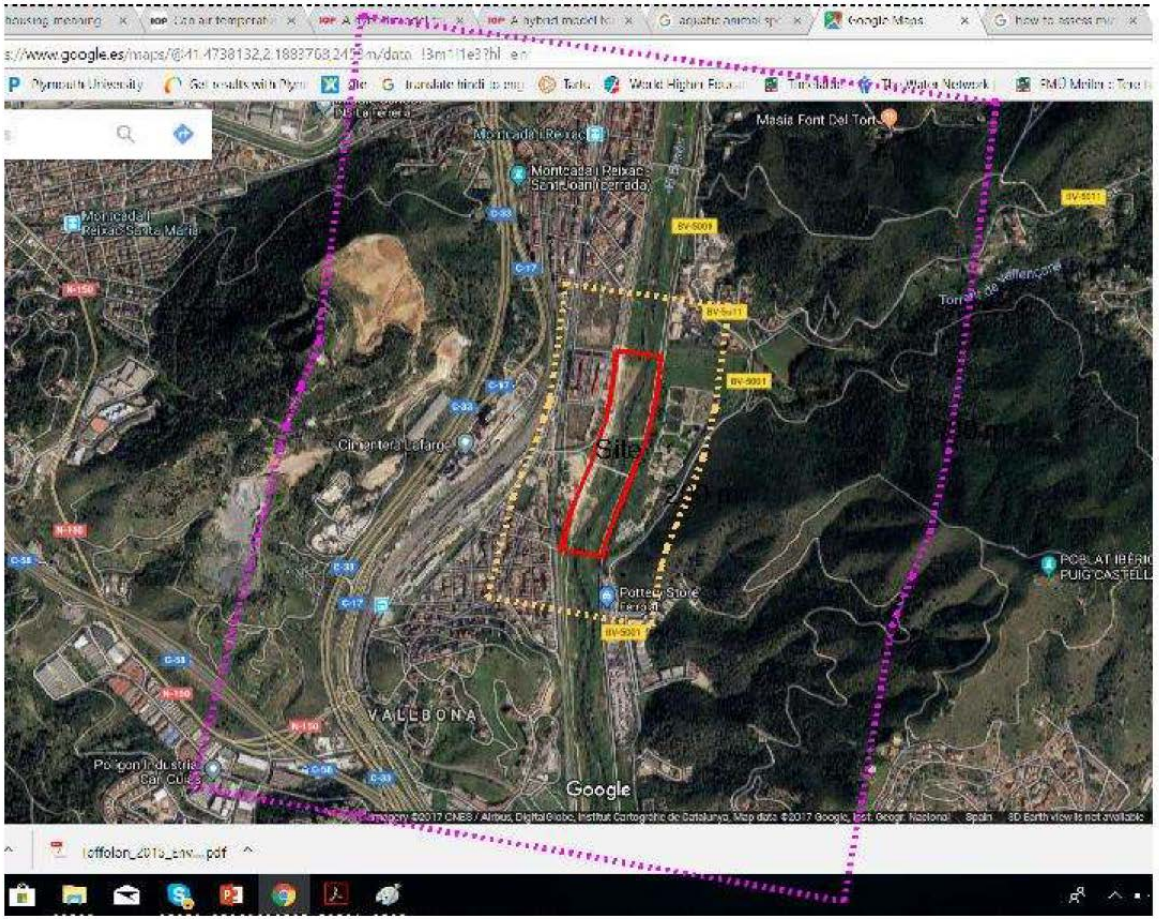
BEAT: Step 4: Survey Administration

Site-Placa Ribera Besos River case study site



Survey has to be carried out within range of buffer areas, (Onsite, 0-200m, 200-1000m)

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Parque Da Cidade case study site, Guimareas

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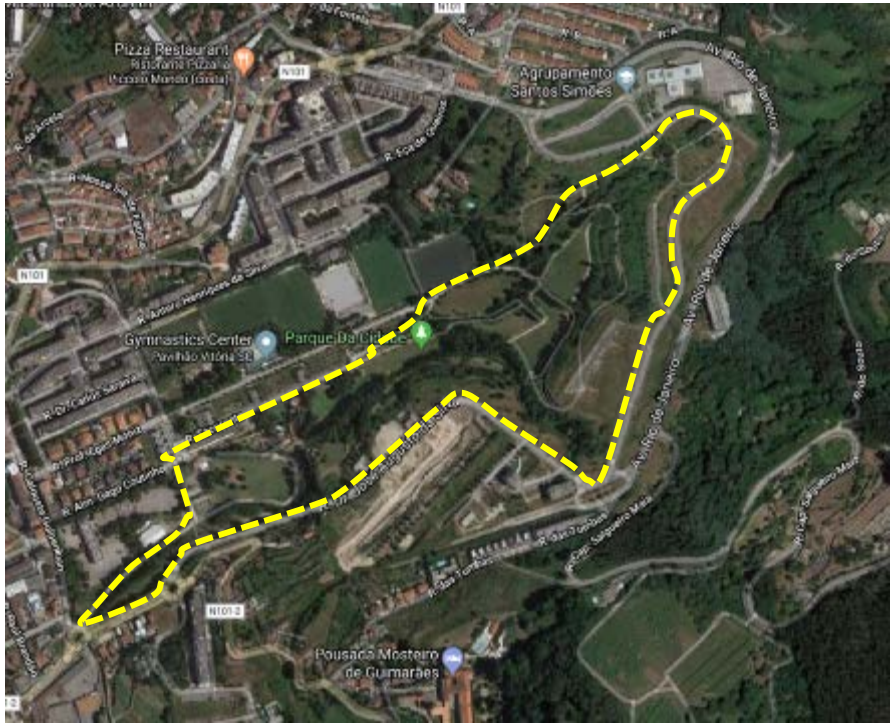
BEAT: Step 4: Survey Administration



Site, Site extent
Key points locations for survey
find out the dominating character or aspects to separate zones

Substrate Assessment- Most common and dominant to be selected

Some aspects need through investigation (e.g. Abiotic and ecological aspects)

Ecosystem services: Discuss and agree on aspects that common for both e.g. information on endangered species, protection area, Ecological importance, water used for drinking, cooling water or industrial water use etc.

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BEAT: Step 4: Survey Administration

Abiotic and ecological aspects:

- Agree on common method or get data from reliable sources.
- Water temp.?
- Turbid water?
- Micro-biological parameter?

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BEAT: Step 4: Survey Administration

Key point to consider:

- Gather and read different maps to find out more information for each section as a desktop study e.g. information regarding aspects with different buffer range, specifically with in 200-1000m or within the watershed area,
- While at site, read all the questions, and prepare a list of aspects or indicators that you will be looking for during initial walk around the blue space.
- Prior agreement of observation path and specific points of observation either covering the full site / or through sampling of key observation points. However, the site should be fully explored.
- In case of large variations observed or anticipated, assessors may agree to divide the site into considerable zones either based on different biotopes or ecological variability, or/ and assessable or manageable site extent as one survey area.
- Anything that is not mentioned in the forms, please make notes and add to the comment section.

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BEAT: Step 4: Survey Administration

Assessment Hours for case study site or segments of case study site:

Training: 2 Hours
Survey: 4-5 hours
Data entry: 30 -1hr minutes.
Moderation: 1-2 Hours

Time of the observation

Any day with clear sky and good weather with comfortable outdoor survey conditions

Evidence of Environmental conditions

Please take pictures of aspects or phenomena in general and specific observations during the day survey. They could be used later to support the results and discussion of BEAT piloting.

Health and safety

Please do not put yourself in unnecessary danger and look after your own health and safety. Always let someone know where you are, what you're doing and when you expect to be back. When feeling threatened or in danger, leave the site immediately.
Wear appropriate outdoor shoes, as the place can be expected to be muddy, wet and slippery.

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BEAT: Step 4: Reporting and score agreement

Work procedure Blue Health Environmental Assessment Tool Field Work in Running Water:

This document has been created to inform the researchers about how the environmental assessment has been conducted at the designated Barcelona Blue Spaces, in this particular case, the Northern Besos Fluvial Park (Montcada i Reixac).

The surveyors were Antonio Gomez Gomez and Sara Fuertes Vila.

- Before Fieldwork:
  Reading the guidance documents and all the surveys forms, we studied the delimited area and their surroundings (Google maps).
  We did a search of the endangered species (http://www.mapama.gob.es/es/biodiversidad/temas/conservacion-de-especies/especies-proteccion-especial/ce-proteccion-listado-situacion.aspx) and invasive species (http://www.mapama.gob.es/es/biodiversidad/temas/conservacion-de-especies/especies-exoticas-invasoras/) in the Spanish Catalogues, looked up for the human impact structures and facilities over the area and searched if the study area is within a protected area (http://sig.gencat.cat/visors/enaturals.html).

  We also decided how to do the assessment (paths and directions).

- Onsite:
  We decided to do the assessment walking downwards on the west side of the river and upwards in the east side. We entered the site by their surroundings (200-1000 m), and also pass through the buffer area. To change from west to east side we use the bridge called "Puente 2 Montcada". Corroborating the previously identified human impacts, and or discarding the potential human impacts previously identified.
  Scoring all aspects.

- After:
  Search in Catalan Water Agency the quality index of the water, Verify the species present in the Besòs river basin through bibliography research (specially aspect 3 and 4).
  Result pooling by the surveyors to discuss the obtained date, and try to arrive to an agreement or explain the reasons why we differ.

Scores Agreement notes Running Water:

Environment	Aspect	Indicator	Antonio	Sara	Agreement
RW Northern Besòs Fluvial Park (Montcada i Reixac)	Metadata	Weather	Cloudy	Cloudy	
	Substrate	Shore zone	Clay	Plants	If we consider the substrate biologically we agree that is clay, but as landscape assessment the area is mostly covered by plants. Himansu opinion?
		Littoral zone	Gravel	Rocky	Our different visions are due to the littoral concept. Antonio includes the nearshore submerged area, and Sara only the limit area between air and water. Himansu opinion?
	Human Impacts	Housings	3	3	
		Buildings		3	
		Industrial Buildings	3	3	
		Agricultural buildings	3	3	
		Agricultural Land	2	2	
		Maintained grassland and lawn area	3	3	
		Pastureland	3	2→3	We saw goats pasturing in the riverside. 
		Gardenland	2→1	1	We set the garden land concept as an area with different vegetal species maintained, no only grass as the grassland
		Loading of shore/beac	1	2→1	Sara considered the limestone query nearby, but she realized that

Himansu Mishra
The landscape could be temporary for example. I would go with clay,

Himansu Mishra
To me it seems we should consider the flooding zone (submerged area), not just draw a clear line

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Thank you for your attention

Universitatea de Arhitectură și Urbanism "Ion Mincu"
Eesti Maaülikool Estonian University of Life Sciences
Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen
HOCHSCHULE WEIHENSTEPHAN-TRIESDORF UNIVERSITY OF APPLIED SCIENCES
ULB Faculté d'Architecture La Cambre Horta
LE:NOTRE Institute
ISOCARP Knowledge for Better Cities