8.5 Distribution of blue space

Project Name: Connecting Nature

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Bluespace area (Applied and EO/RS)	Green Space Management
Description and justification	Measuring bluespace change in urban areas can provide an index representing the degree of nature conservation, and improving public health and quality of life, as they are directly related to the natural water circulation, environmental purification and the green/blue network. More green and blue space also reduces vulnerability to extreme weather events like urban heat islands and flooding by heavy rainfall. Bluespace area can be used as an indicator of these environmental, social and economic benefits. In addition to ground-truthed mapping, in order to characterise urban blue infrastructure and assess changes of different bluespace types over varying time periods different remote sensing techniques and GIS can be used. The most common use of RS data is for the purpose of greenness identification. Many of these metrics are equally applicable to bluespaces. Data on bluespace area collected in these ways can be used to: • Quantify the distribution of bluespace across target areas; • Support the equitable distribution of bluespace through urban planning for environmental, social and economic benefits; • Provide underpinning data for other indicators such as ecosystem service mapping, stormwater management, biodiversity mapping, etc.
Definition	Measure change in blue space (ponds, rivers, lakes) in urban area (%, hectares or ha/100km) due to NbS based on more applied and participatory methods.
Strengths and weaknesses	**Applied methods:** Available greenspace datasets, for example in the UK, are pretty comprehensive and accurate, but there can be limitations for area i.e., >0.25ha depending on resources available. A weakness is it does

	not capture the quality/health of the green/bluespace which would influence ES benefits **Earth observation / Remote sensing methods:** Currently, there is a variety of research focused on mapping of UGS, based on remote sensing data including the mapping of bluespace. With the capacity to differentiate land cover (LC) types at a large scale, remote sensing has been widely used for vegetation mapping in various environments. Satellite imagery has been adopted for the monitoring of vegetation both in urban and rural areas. The techniques applied for this can generally be equally applicable for bluespace areas. As with greenspace mapping, strength of evidence is based on the scale of bluespace analysed compare to the resolution of the satellite data and confidence of identifying bluespace compared to surrounding infrastructure. However, with suitable data, strong evidence can be provided.
Measurement procedure and tool	A variety of methods exist from applied/public participation techniques through to earth observation/remote sensing approaches. For further details on measurement tools and metrics, including those adopted by past and current EU research and innovation projects can be found in: Connecting Nature Indicator Metrics Reviews Env56_Applied and Env56_RS
Scale of measurement	**Applied methods:** City-scale typically, but may be possible to use the data to monitor local-level changes in greenspace. **Earth observation / Remote sensing methods:** Remote sensing and geographic information system (GIS) provide powerful tools for mapping and analysis of UGS at various spatial and temporal scales.
Data source	
Required data	Required data will depend on selected methods, for further details see applied and earth observation/remote sensing metrics reviews in: Connecting Nature Indicator Metrics Reviews Env56_Applied and Env56_RS
Data input type	Data input types will depend on selected methods, for further details see applied or earth observation/remote sensing metrics reviews in: Connecting Nature Indicator Metrics Reviews Env56_Applied and Env56_RS
Data collection frequency	Data collection frequency will depend on selected methods, for further details see applied or earth observation/remote sensing metrics reviews in: Connecting Nature Indicator Metrics Reviews Env56_Applied and Env56_RS

Level of expertise required	**Applied methods**: Accessing the public datasets should be straightforward but likely some expertise in GIS is needed, particularly for more comprehensive ILM methodology. **Earth observation/Remote sensing methods**: Experience of working with large datasets related to remotely sensed, climatic and environmental parameters as well as their statistical analysis using tools is important. Knowledge of GIS techniques such as multi-criteria evaluation and sensitivity analysis are also desirable. Knowledge of ecosystem services is required and experience of their quantitative and/or spatial assessment is advantageous.
Synergies with other indicators	Synergies with other greenspace mapping indicators, and the data can be used as an index for other environmental and health/wellbeing indicators.
Connection with SDGs	All SDGs except 1 and 5: Fishing opportunities; Health & Wellbeing benefits; Links to environmental education; Clean water benefits; Hydro-electric opportunities; Job creation; Improved blue infrastructure; Social equality in relation to bluespace; Sustainable urban development; Responible use of water; Climate change adaptation; More sustainable water management; Associated terrestrial habitat benefits; Environmental Justice; Opportunities for collaborative working.
Opportunities for participatory data collection	**Applied methods:** If used, public perception questionnaires would be the main participatory process. **Earth observation/Remote sensing methods:** The accuracy of the resulting classification derived from the RS can be improved by incorporating digitised landscape and environmental data available from local environmental NGOs (e.g., City of Trees etc.) or community groups, which served principally to correct misclassification. Similarly, participatory approaches can also be vital to supplement quantity of bluespace data with quality assessments.
Additional information	
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