

## Indicator: Physiologically equivalent temperature (°C)

**Naturvation challenges:** Climate action for adaptation, resilience and mitigation

**SDGs:** 13

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### Indicator description

Physiologically equivalent temperature (PET) is a human biometeorological index that model how comfortable the climate is (1 -3). As such it can be used to indicate an NBS's effect to mitigate or adapt to climate change. An index of how comfortable different PETs are for humans have been developed, (2 & 3). To compute PET is much more complicated than to measure the air temperature. PET can be calculated from human energy balance model (1). The model is an integrates parameters related with human body, clothing, activity, and environment (1). Compared to other thermal indices that are also obtained from the human energy balance, such as the predicted mean vote (PMV), PET has the advantage of a widely known unit (°C), which makes results more comprehensible to urban or regional planners (4). To estimate the thermal comfort at a site, combined sensors and data loggers can be used to carry out measurements every 2 min of wind (m/s), air temperature (°C), radiation and relative humidity (%). There are also special software (e.g. Rayman & ENVI-met (5 & 6)) that can model PET based on extensive information about environment and climate.

### Indicator scoring

The scores of PET were estimated and modelled using local metrological variables and physical characteristics of a human. We used studies that have estimated PET for at least 2 Nature-based solutions (NBS) within a city using the same meteorological situation and human characteristics.

In cases where a study contained several sites of the same NBS, average PET per NBS type was computed. Parks were the only NBS present in all studies, thus parks were used as reference in all studies. We therefore calculated the PET difference between each NBS and parks, and then averaged differences per NBS. Scores were derived by linearly normalising the values onto the scale 1 to 5. Where the lowest mean value correspond to score 5 and the highest mean value correspond to score 1.

Scores, physiologically equivalent temperature differences (°C) compared to parks		
Nature-based solution	Score	Mean value (min – max)
Parks and (semi)natural urban green areas	4	0 (0 – 0)
Urban green areas connected to grey infrastructure	3	0.5 (-6 – 11)
Blue areas	5	-1.4 (-5.6 – 3)
External building greens	No score	No values found
Allotments and community gardens	(1)	Only a single value available (+3.5)
Green areas for water management	No score	No values found





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