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Spatial deployment of Nature-based Solutions to support carbon neutrality for 50 EU cities.

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Clear implementing plan for Nature-based solutions (NBS) beyond conceptualization is critical for successful in mitigating urban carbon emissions. In this paper, we demonstrate an approach to deploy nature-based solutions on high-resolution (25x25-meter) land use grid and its carbon emission reduction benefits for 50 major European Union (EU) cities. The deployment process takes 3 parts: 1) downgrading carbon emission data with larger spatial scales (10x10km GID data) to high-resolution cells using land use and socioeconomic data; 2) identifying opportunities and suitability of deploying NBS on these land use cells from a database with meta-analysis on the emission reduction potentials of different types of NBS; 3) Estimating total carbon emission potentials from spatial deployment and coupling of multiple NBS with parametric simulation. Our results indicate that vast areas of urbanized and un-urbanized lands in EU cities can apply NBS to further mitigate carbon emissions. The reduction potential is huge and can contribute to a critical wedge of carbon neutrality.