



## **Forecasting global urban expansion and its effect on terrestrial net primary productivity**

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Net primary productivity (NPP) is of great importance to global terrestrial carbon cycle and global climate change. Although many relevant studies have been carried out, attempts on its consequence caused by urban expansion are still limited. In this study, we quantified the NPP loss after urbanization by 2100, through linking a global land use/cover dynamic (GLCD) model and a neighborhood proxy method. Finer resolution (30m) global land cover map as well as detailed land demand dataset (half degree) were adopted for urban growth modeling and NPP quantification. Our results indicate that (1) by 2100, the global urban area will reach  $125.15 \times 10^4$  km<sup>2</sup>, with a growth rate of 2,892 km<sup>2</sup>/year; (2) the NPP loss due to urbanization during period of 2010-2100 is  $9 \times 10^{(-3)}$  PgC, which accounts more than 3% of the total urban NPP in 2010. In addition, by the end of this century, most urbanized land is estimated to happen in developing countries, e.g. China and India. Overall, global urban expansion results a neglect impact to NPP. Therefore, more attentions should be paid to cope with urban development in future, such as urban planning or managements.