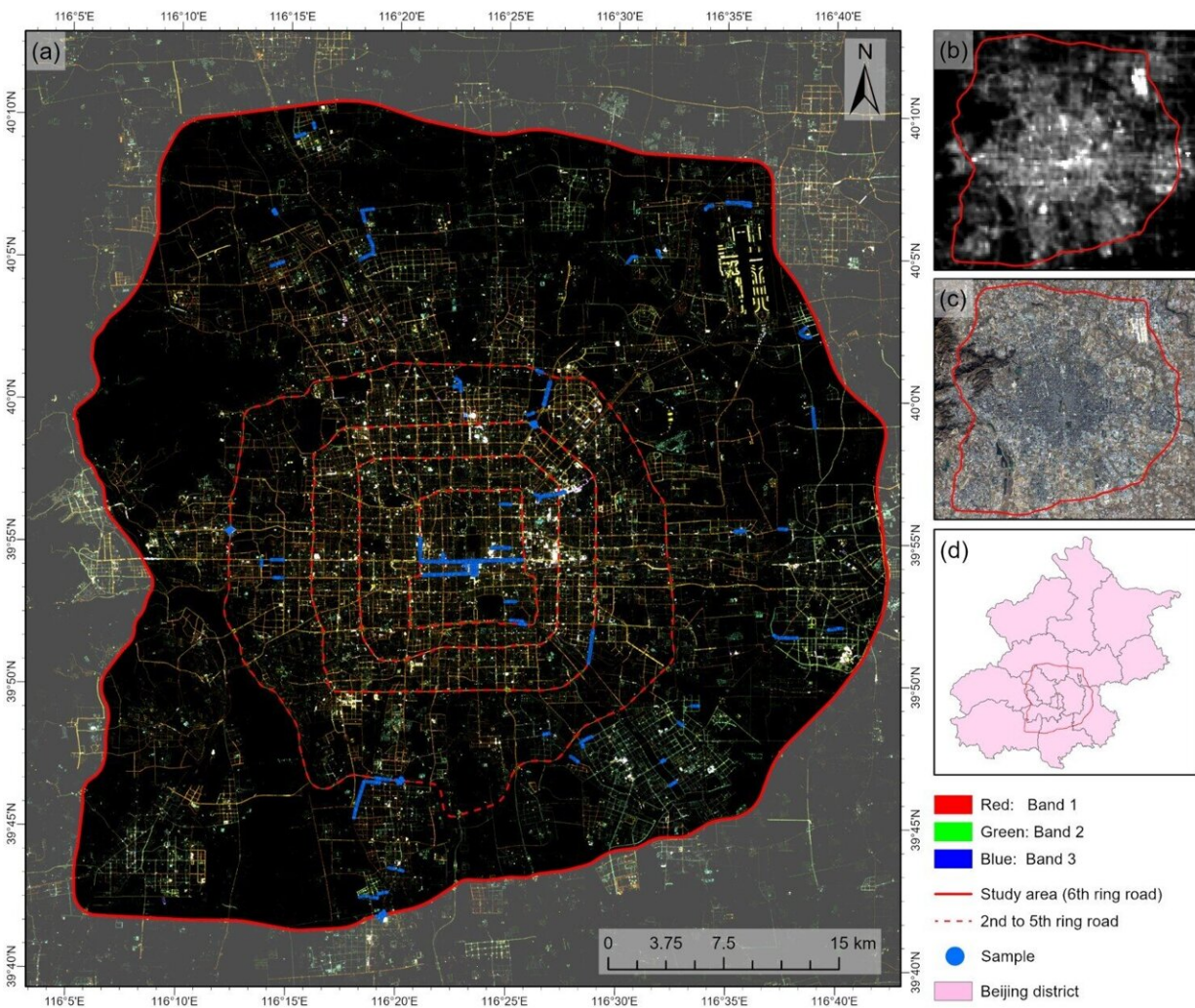# Using satellite images to manage LED light pollution problem

January 16 2024, by Liu Jia

Map of the study area: (a) GI images from SDGSAT-1 satellite, (b) NPP-VIIRS images, (c) Landsat8 OLI images, and (d) Beijing administrative district. Credit: *International Journal of Digital Earth* (2023). DOI: 10.1080/17538947.2023.2297013

The widespread transition from artificial light at night (ALAN) to light-emitting diodes (LEDs) has inadvertently given rise to a new challenge—blue light pollution and its associated adverse effects.

To address this issue, scientists from the Aerospace Information Research Institute (AIR) of the Chinese Academy of Sciences (CAS) have turned to the Sustainable Development Science Satellite-1 (SDGSAT-1) as a tool to manage the impact of modern illumination sources on the urban environment. The study was published in *International Journal of Digital Earth*.

An approach that leverages SDGSAT-1's multispectral and high-resolution capabilities to rapidly, accurately, and comprehensively discriminate between various illumination sources was unveiled. Scientists took Beijing as an example, and found that this approach is highly effective in distinguishing various types of light sources, boasting an overall accuracy of 92% for ALAN and an impressive 95% for streetlights.

Analysis of SDGSAT-1 images revealed clear and distinct illumination patterns, which showed spatial heterogeneity in ALAN along Beijing's 5th Ring Road, providing valuable information for how light pollution varies across different urban areas.

Scientists identified statistically significant disparities between road classes and types of streetlights. Notably, there was an increase in the usage of LED streetlights as the road class diminishes, which showed the influence of urban planning and infrastructure on the prevalence of specific lighting technologies.

SDGSAT-1 emerges as a valuable tool by offering insights into the

complex landscape of urban lighting management.

More information: Ziqi Yin et al, Identification of illumination source types using nighttime light images from SDGSAT-1, *International Journal of Digital Earth* (2023). DOI: 10.1080/17538947.2023.2297013

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