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Heterogeneity in urban landscapes plays a vital role in the flow of matter, energy, and information that in turn leads to the change in Land Surface Temperature (LST) over time. The relationship between LST and heterogeneity serves as a valuable resource for urban design, planning, and management. It aids in making informed decisions about how to manage urban land cover to reduce LST. This study seeks to make urban heterogeneous landscapes more balanced to mitigate and regulate LST. In this study, we examined three key landscape characteristics: patch shape complexity, structural and spatial heterogeneity within the landscape, and the connectivity between similar and dissimilar patches. These factors play a crucial role in achieving an appropriate level of heterogeneity for sustainable development. Subsequently, we analyzed these three landscape characteristics in Tehran to examine their relationship with LST, utilizing landscape ecology principles, landscape metrics, and statistical methods. Our findings suggest that the built patches hold greater significance. Furthermore, the shape complexity of both built and green patches plays a critical role in reducing LST, which has the potential to mitigate the urban heat island effect. Consequently, when devising strategies to enhance the heterogeneity of urban environments, built patches should be given priority.