# Cooling power of urban river under the background of urbanization

## Abstract

## Introduction

### 1.1. UHI

* 城市化正在进行
* 城市化对环境的影响
* 城市热岛效应
* 热岛效应的危害
* 需要相关手段
* With population explosion and economic development, urbanization has witnessed significant global expansion globally.
* According to the prediction from the United Nations, this trend will continue in the following decades and the urbanization rate is estimated to be up to 68 % by 2050 (United Nations. 2019).
* As has been observed in numerous cities over the world, urbanization has caused adverse effects on local environment, such as water and air pollution, ecosystem degradation and urban heat island (Wang et al., 2020; Ahmad et al., 2021).
* Urban heat island is a phenomenon by which temperature tends to be higher in urban areas compared to the surrounding rural areas.
* Elevated temperature is found to increase energy consumption in summer and pose a threat to public health (Guan et al., 2017; Nieuwenhuijsen et al., 2018).
* Therefore, certain measures are necessary to address the associated negative effects.

## 1.2. 水体降温效应

* 目前，主要的城市降温措施包括改变表面材料、优化土地覆盖、促进通风等。
* 对于土地覆盖与利用，水体的影响关注较多。
* 水体包括河流、湖泊等类型
* 由于水体的热特性，其对周边热气候有显著影响。在白天的大多数时候，水体对周边环境有降温效应。
* 降温范围
* 河流与湖泊有不同
* 相对湖泊，河流相关研究较少
* 在有限的河流热效应研究中存在的不足
* Primary measures to address excessive urban heat include altering surface materials, optimizing spatial layout of land cover, and promoting ventilation.
* In terms of land cover, the impact of water bodies have received much attention.
* In urban areas, water bodies mainly consist of rivers, lakes, canals, etc.
* Because of the unique thermal properties of water, such as low thermal conductivity and high specific heat capacity, water bodies tends to exert cooling influences on the surrounding areas during most daytime hours.
* Currently, researches on the cooling effects of urban water bodies primarily focus on lakes, with fewer studies addressing the impacts on rivers.

### 1.3. 城市化对UHI的影响

    - 全球（尤其是中国）正在进行广泛的城市化

    - 土地利用正在改变

    - 土地利用变化对气候的影响

### 1.4. 相关研究不足

    - 水体降温研究中，尚无考虑土地利用动态变化的。

### 1.5. 研究目的

## References

* Ahmad, Mahmood, et al. "Modelling the dynamic linkages between eco-innovation, urbanization, economic growth and ecological footprints for G7 countries: does financial globalization matter?." Sustainable Cities and Society 70 (2021): 102881.
* Guan, Huade, et al. "Incorporating residual temperature and specific humidity in predicting weather-dependent warm-season electricity consumption." Environmental Research Letters 12.2 (2017): 024021.
* Nieuwenhuijsen, Mark J. "Influence of urban and transport planning and the city environment on cardiovascular disease." Nature reviews cardiology 15.7 (2018): 432-438.
* United Nations. (2019). World urbanization prospects: The 2018 revision.
* Wang, Shaojian, et al. "Strategizing the relation between urbanization and air pollution: Empirical evidence from global countries." Journal of Cleaner Production 243 (2020): 118615.