

### Introduction

The IPCC (Intergovernmental Panel on Climate Change) developed the **Heat Health Risk Indicator (HHRI)** to assess heat-related health risks by combining **Hazard** (intensity and frequency of heat), **Exposure** (population density and land use), and **Vulnerability** (socio-economic and health factors). However, HHRI has never been analysed in Mediterranean or African regions, despite their high sensitivity to extreme heat. The **Universal Thermal Climate Index (UTCI)** complements this by measuring outdoor thermal stress on the human body. This research presents a novel approach by **coupling HHRI with UTCI** to enable a comprehensive assessment of both physiological heat stress and socio-environmental risk in **Algiers**. It also integrates **Local Climate Zones (LCZs)**, a classification of urban and natural landscapes based on land cover and morphology to identify spatial disparities in heat exposure. Ultimately, the study aims to support the development of a **GIS-based heat warning tool** tailored to local urban conditions.

### Objectives

- 1 Couple HHRI and UTCI**
- 2 Assess LCZs based Heat Risk**
- 3 GIS-Based Early Warning Tool**

### Methodology

Summer 2001-2023

#### Satellite Imagery



#### Census Data



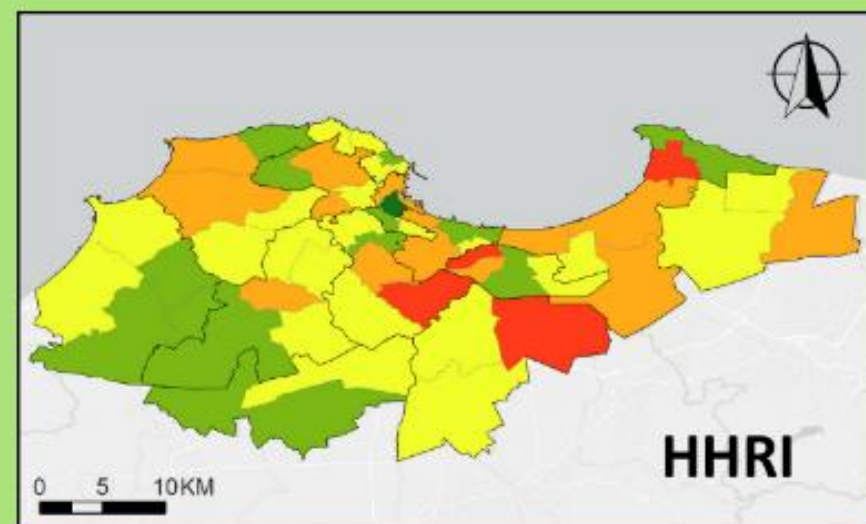
#### Meteorological Data



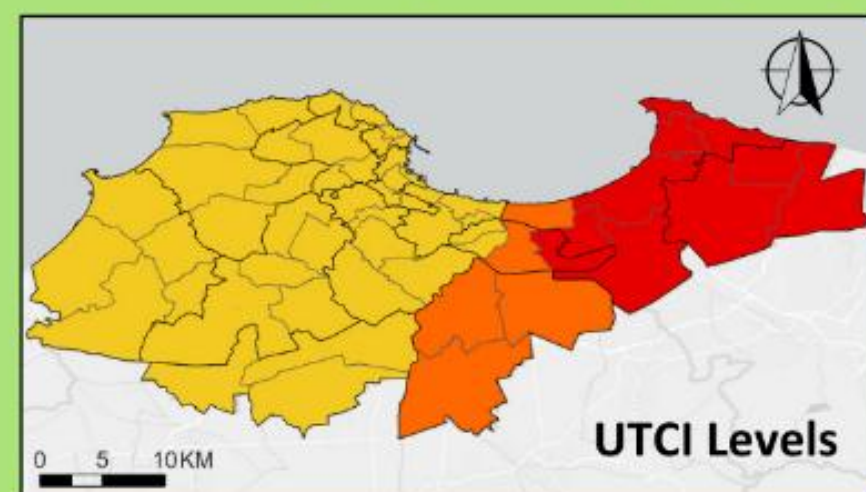
1



$$HHRI = H \times E \times V$$



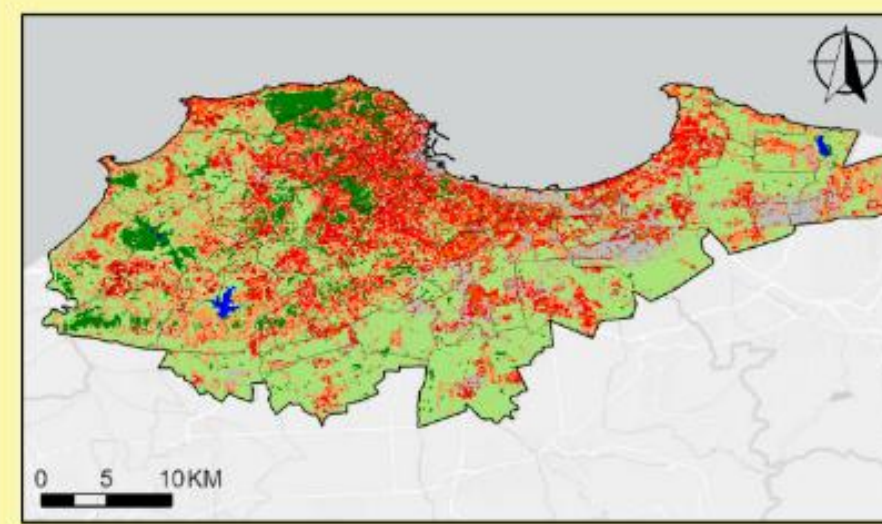
$$UTCI = f(T_a, T_{mrt}, V, e)$$



2



#### LCZ Classification



Calculation of Heat Risk levels per LCZ type

Identification of LCZs with the highest Risk

3



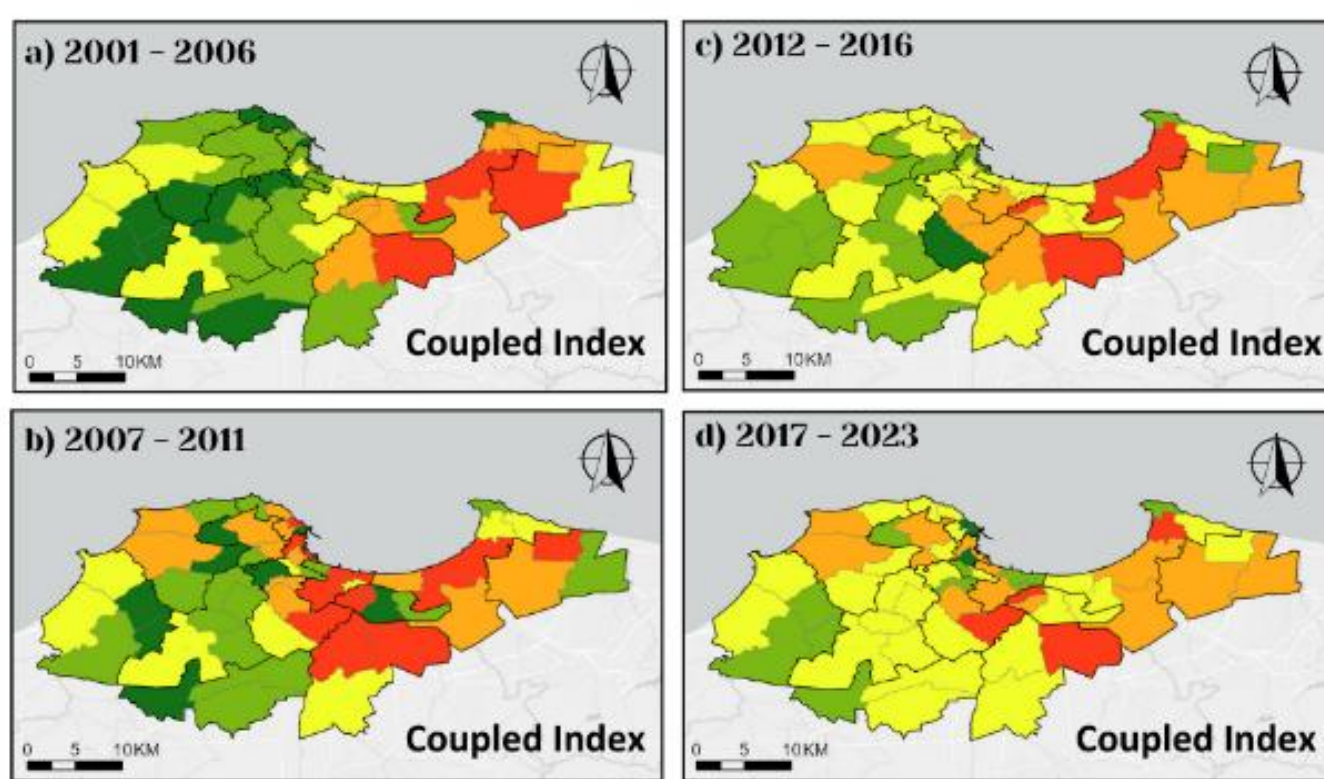
#### Risk Monitoring



Completed Steps

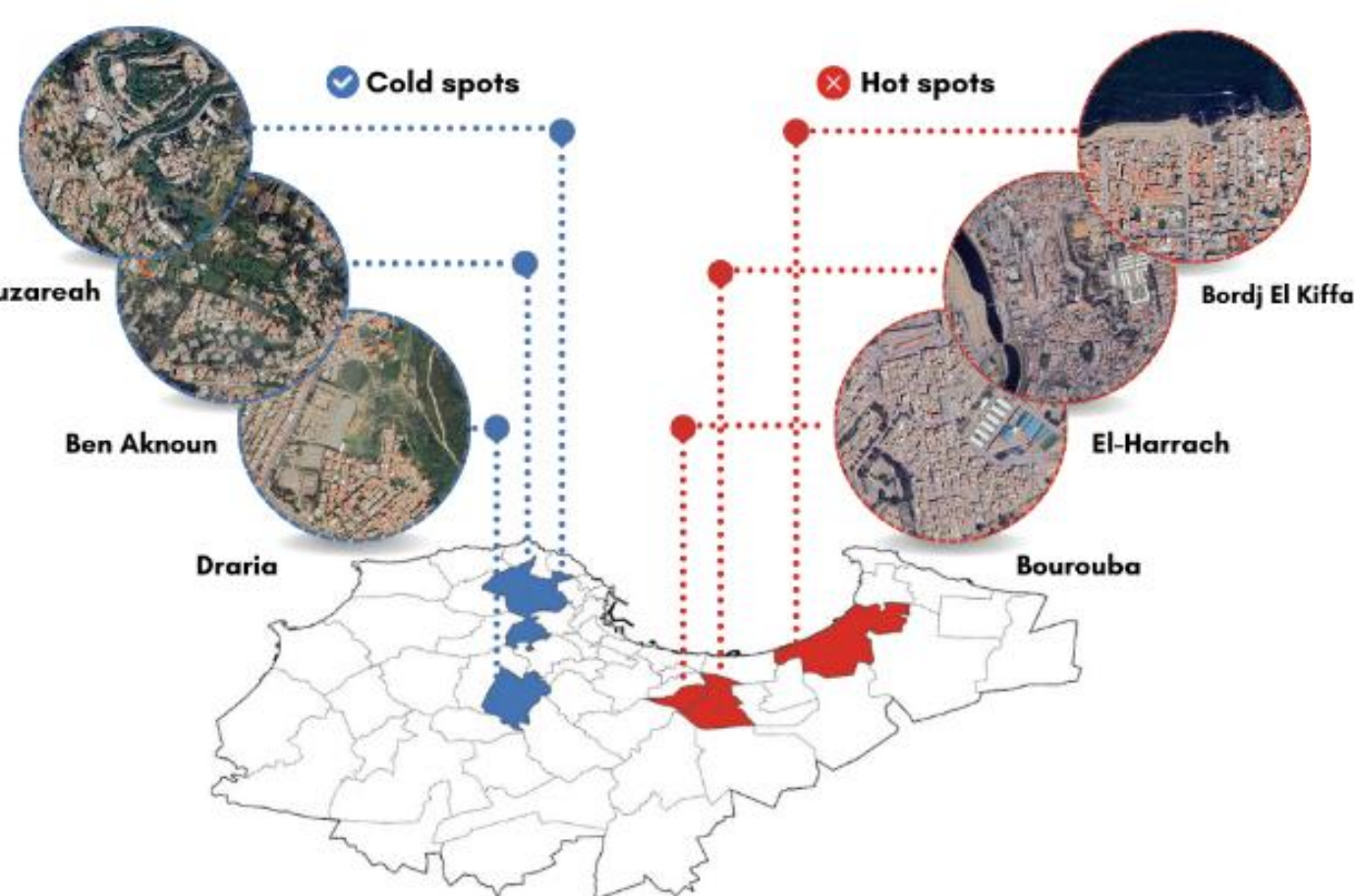
Future Steps

### Preliminary Results

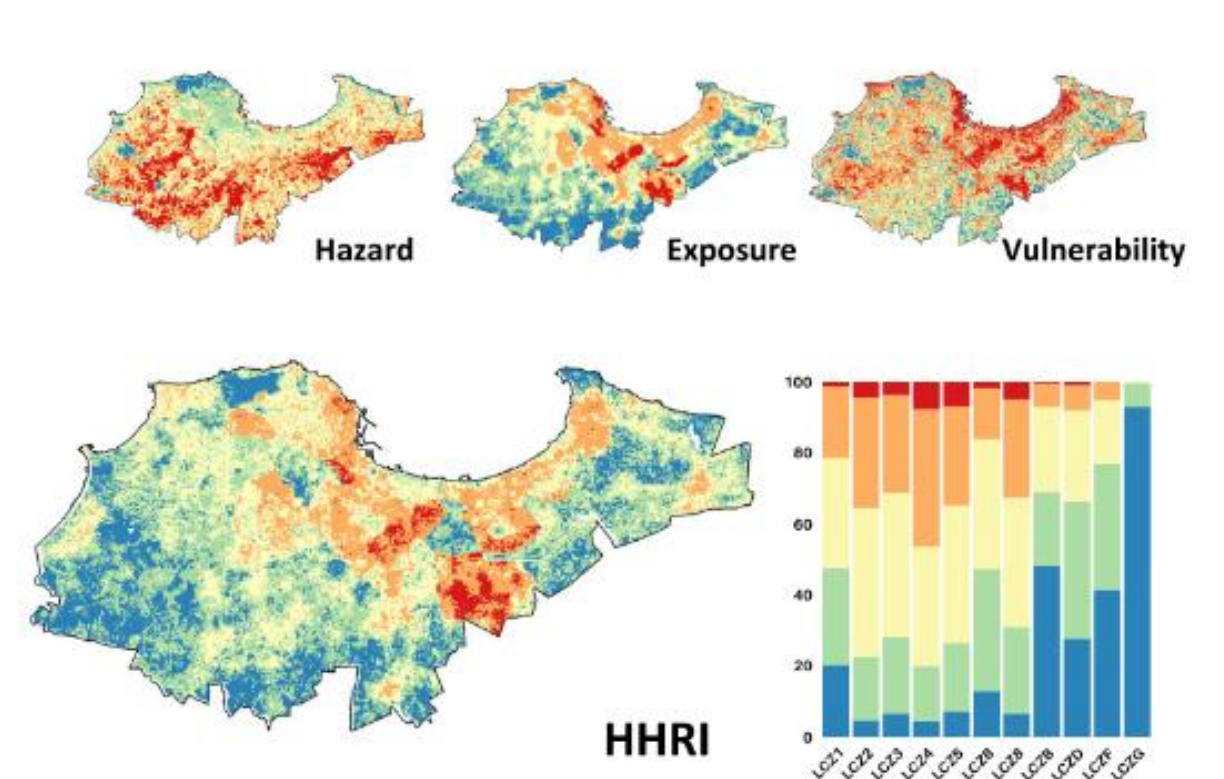


Very high (red), High (orange), Moderate (yellow), Low (light green), Very low (dark green)

Spatial distributions of the Coupled Index in Algiers (2001-2023)



Persistent Hot spots and Cold spots of the Coupled Index in Algiers (2001-2023)



Very High (red), High (orange), Moderate (yellow), Low (light green), Very Low (dark green)

Heat Health Risk components across LCZs in Algiers (2015-2023)

