



Rome

Urban Heat Resilience Profile

Rome will be facing increasing challenges from rising temperatures and more frequent heatwaves. As climate change intensifies, the need for effective urban heat resilience strategies becomes crucial to protect the health and well-being of its residents.

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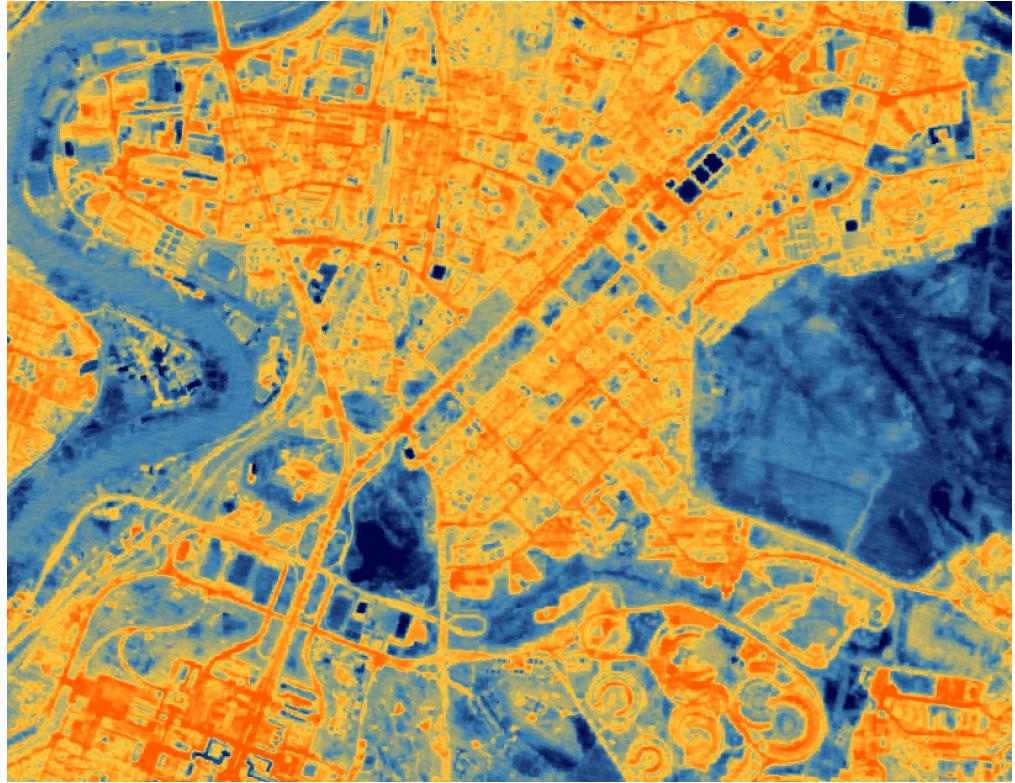
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Introduction

Rome will be facing increasing challenges from rising temperatures and more frequent heatwaves.

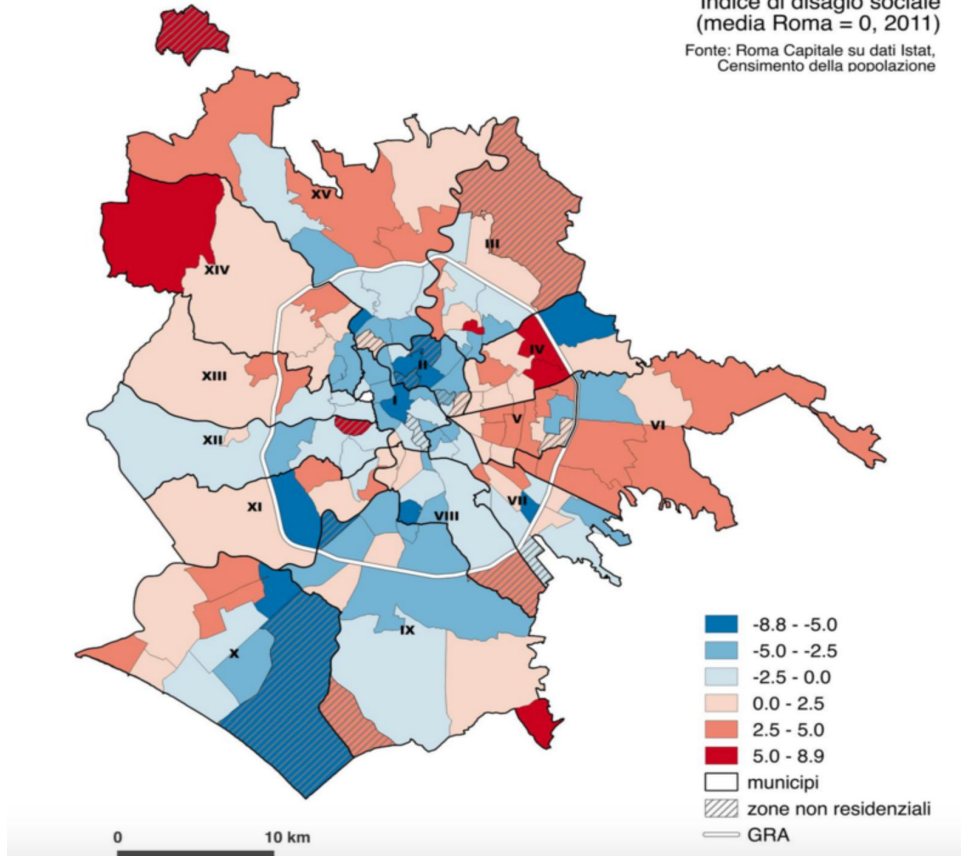
The need for effective urban heat resilience strategies becomes crucial to protect the health and well-being of its residents.



Rome Heat Map (based on high resolution thermal satellite data)

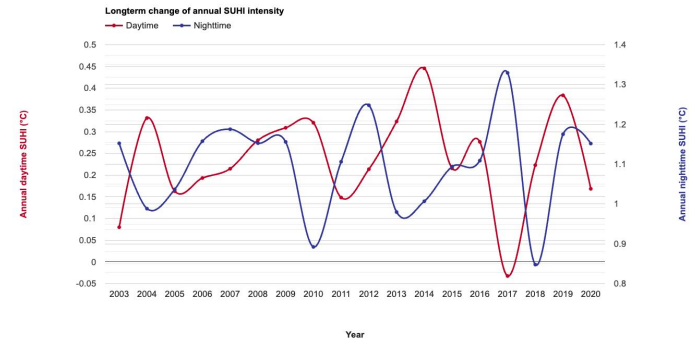


Indice di disagio sociale
(media Roma = 0, 2011)
Fonte: Roma Capitale su dati Istat,
Censimento della popolazione



Current Heat Risk Areas

- Geographic and Demographic Overview
- Rome's diverse landscape includes densely populated urban areas, historic sites, and suburban zones.
- Vulnerable populations include the elderly, children, those with preexisting health conditions, and low-income communities with limited access to cooling resources.
- Heat Hazard Assessment



- Historical Data: Over the past few decades, Rome has experienced a significant rise in average temperatures and an increase in the frequency and intensity of heat waves.
- Current Hotspots: Areas such as the city center
- Exposure and Vulnerability
- Demographic Factors: Neighborhoods
- Infrastructure Risks: Key infrastructure



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Heat Impact

What is Dangerous Heat?

Dangerous heat refers to extreme temperature conditions that pose significant health risks to humans, animals, and the environment. These conditions are characterized by high temperatures, often combined with high humidity, which can lead to heat-related illnesses such as heat exhaustion, heat stroke, and dehydration. According to the World Health Organization (WHO), dangerous heat conditions are typically marked by a Heat Index (a measure that combines air temperature and humidity) above 90°F (32°C).

Health Risks of Extreme Heat

Exposure to extreme heat can have severe health consequences, including:

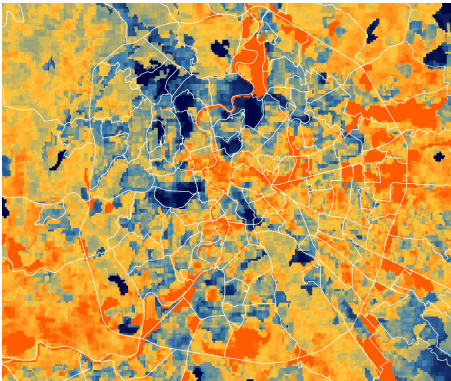
1. **Heat Exhaustion:** Symptoms include heavy sweating, weakness, dizziness, nausea, and headache. If not addressed, it can escalate to heat stroke.
2. **Heat Stroke:** This is a life-threatening condition where the body's temperature regulation fails. Symptoms include high body temperature, altered mental state, cessation of sweating, and possible unconsciousness.
3. **Dehydration:** Prolonged exposure to high temperatures can lead to dehydration, which can cause kidney stones, urinary infections, and other health issues.
4. **Exacerbation of Chronic Conditions:** High temperatures can worsen conditions such as cardiovascular, respiratory, and renal diseases.



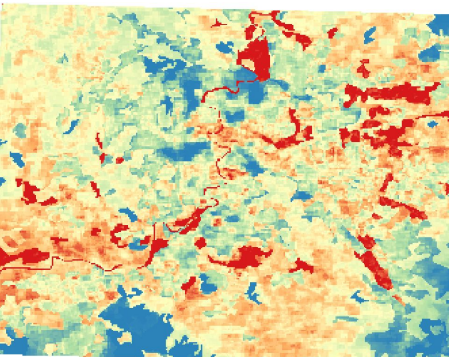
Future Heat Risk Predictions

The heat risk in Rome is determined by a combination of impact, exposure, and vulnerability. To estimate the heat risk that residents face, we integrated various maps and data layers as shown below. This approach allows us to provide a comprehensive view of how heat affects different parts of the city.

Heat Risk Rome

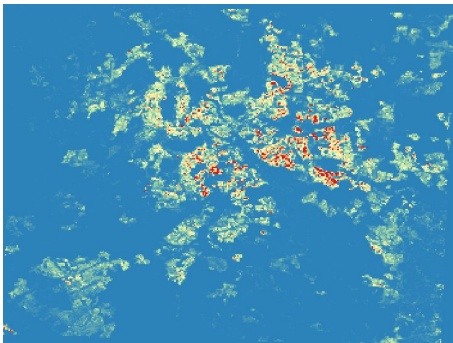


Hazard
Heat impact



x

Exposure
Population

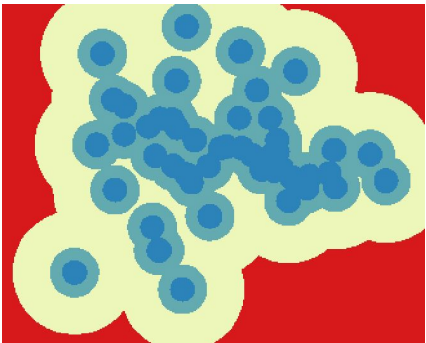


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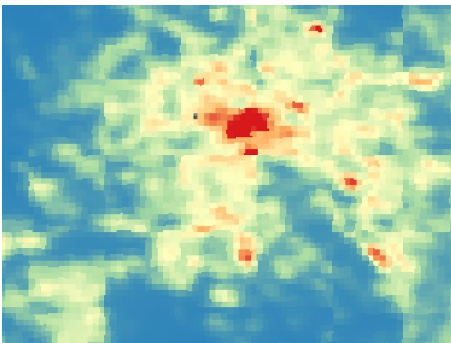
Vulnerability

Health facility distance



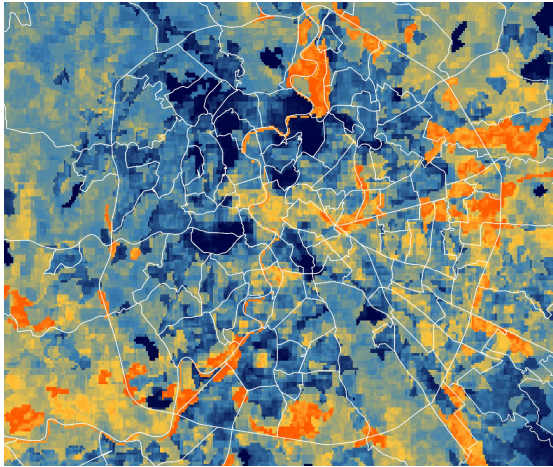
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GDP

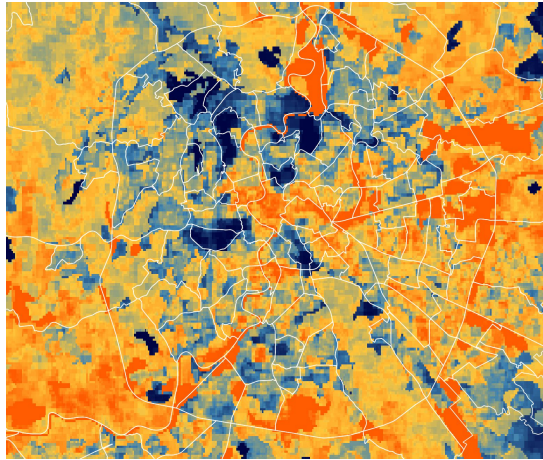


Future Heat Risk Predictions

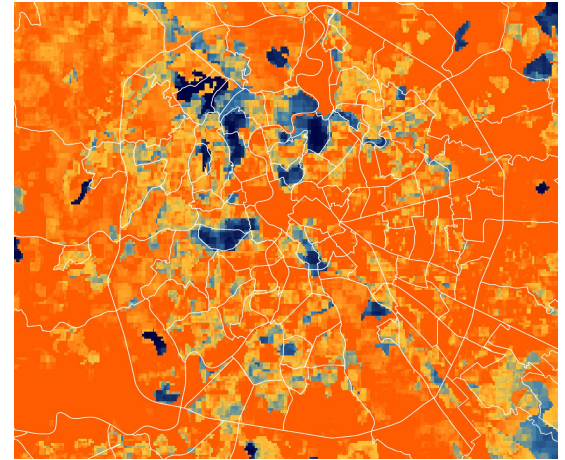
- Climate Projections
- Temperature Trends: Climate models predict a continuing rise in temperatures for Rome
- Heatwave Frequency: The frequency of extreme heat events is projected to double
- Impact Assessments
- Health Impacts: Increased heat exposure
- Economic Losses: The economic impact of heatwaves



2020



2030



2050

Rome is expected to experience a significant increase in dangerous heat conditions over the next few decades. Climate projections indicate that the frequency and intensity of heatwaves will double by 2040, continuing to rise through 2060. These changes are depicted in the provided heat maps, which show a dramatic increase in areas affected by extreme heat from 2024 to 2060.

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Heat Impact on Rome

Predicted Impacts

1. Population Exposure:

- **2020:** Currently, parts of Rome experience occasional heatwaves, primarily affecting vulnerable populations such as the elderly, children, and those with pre-existing health conditions.
- **2030:** The frequency of extreme heat events will increase, potentially affecting a larger proportion of the population. It is estimated that several hundred thousand residents could be at risk during peak heat periods.
- **2050:** By this time, almost all of Rome will be subjected to dangerous heat levels, potentially affecting millions of residents. This widespread exposure could lead to increased morbidity and mortality rates.

2. Health Impacts:

- **Hospital Admissions:** As heatwaves become more frequent and intense, hospitals will likely see a surge in admissions for heat-related illnesses such as heat exhaustion, heat stroke, and dehydration.
- **It is estimated that hospital admissions could increase by 50-70% during peak heat periods by 2050.**
- **Chronic Conditions:** Higher temperatures can exacerbate chronic conditions such as cardiovascular and respiratory diseases, leading to increased healthcare demands and potentially higher mortality rates.

3. Environmental Impacts:

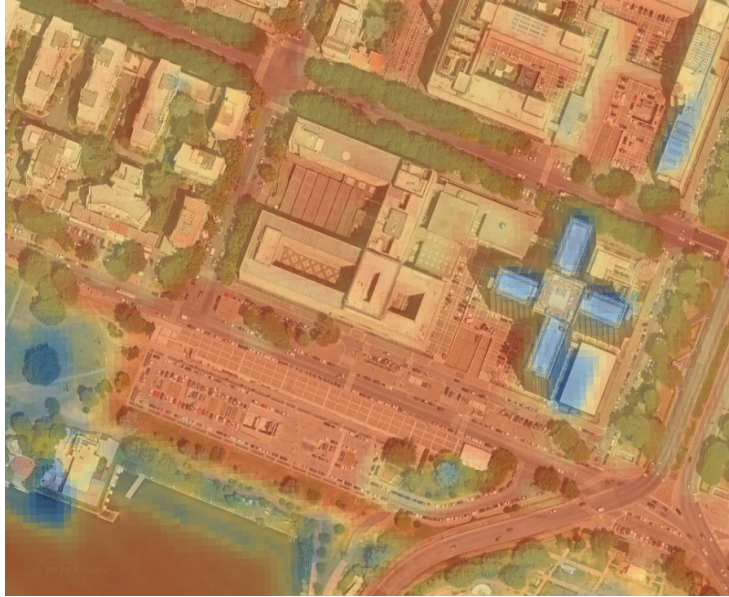
- **Plant Life:** Native plant species may struggle to survive in the altered climate, potentially leading to a loss of biodiversity. Agricultural activities could also suffer, with heat stress affecting crop yields and food security.
- **Water Resources:** Higher temperatures will increase evaporation rates, reducing the availability of water resources. This could lead to water shortages, impacting both human consumption and agricultural needs.

4. Economic Consequences:

- **Productivity:** Extreme heat can reduce labor productivity, especially in outdoor occupations. This can have significant economic repercussions, affecting everything from construction to tourism.
- **Energy Demand:** The need for cooling will drive up energy consumption, leading to higher costs for residents and strain on the energy infrastructure. This could necessitate costly upgrades to the power grid to prevent outages during peak demand periods.



Resilience Strategies



Current Measures

Rome has implemented several measures to mitigate heat risks, including the expansion of green spaces, the establishment of cooling centers, and public awareness campaigns.

The city's urban planning initiatives are increasingly focusing on enhancing building designs to improve natural cooling and ventilation.

Future Initiatives

Green Infrastructure: Continued investment in urban greening projects, such as tree planting and green roofs, to reduce the urban heat island effect.

Policy and Planning: Development of comprehensive heat action plans that incorporate early warning systems, emergency response strategies, and long term urban planning reforms.

Community Engagement: Encouraging community participation in resilience building activities and promoting adaptive behaviors among residents.

By utilizing high-resolution analytics, Rome can strategically allocate resources for urban greening projects, resulting in cooler, more livable environments and enhanced resilience to climate change.

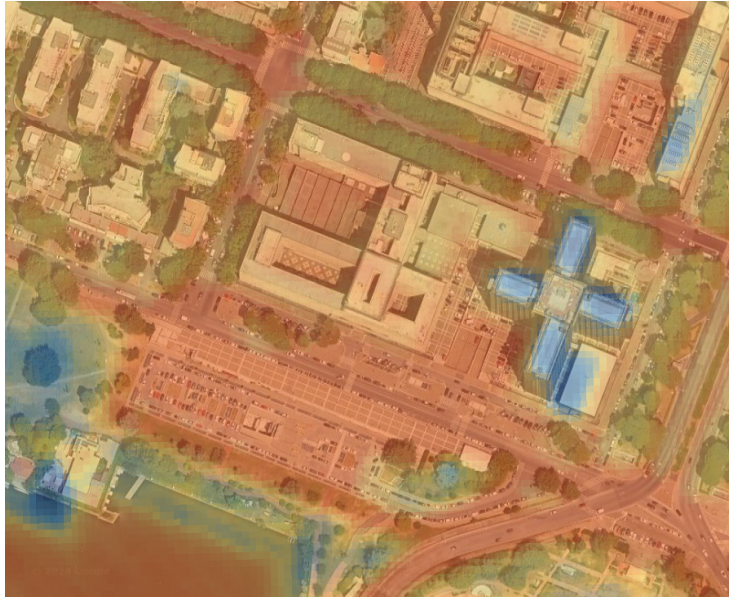
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Resilience Strategies



Current heat profile



Suggested tree plantation

Locations with sparse vegetation are targeted to enhance biodiversity and ecological health. Planting in these areas helps to create continuous green corridors, which are beneficial for both wildlife and human well-being.

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Conclusion

- Rome's Urban Heat Resilience Profile highlights the city's current vulnerabilities and outlines future risks based on comprehensive data and research.
- By highlighting the current vulnerabilities and future risks associated with rising temperatures, it underscores the urgent need for proactive measures.
- The profile's data-driven insights and strategic recommendations provide a roadmap for making Rome a more resilient city, capable of withstanding the increasing threats posed by extreme heat.
- This comprehensive approach is critical for safeguarding the health, economy, and environment of Rome in the face of a warming world.

