

# COOLTOWNS

## Roadmap

Cool Towns is a collaboration between 14 partners aiming to help you to find solutions to street level heat stress and so increase resilience to this impact of climate change at the scale of small and medium sized cities.

# THE ROADMAP

## What is it ?

This is a tool to help organisations, and particularly local authorities, to develop heat resilient strategies.

The roadmap provides an overview of all the documents produced by the Cool Towns project, and shows how these can be used to take six steps to enable a heat resilient strategy to be achieved.

## Poster

The poster is a guide to help you to develop a heat resilient strategy for your city, just follow the six steps to access the resources the Cool Towns project has produced to help you. These can all be downloaded free from the internet.

[www.cooltowns.eu](http://www.cooltowns.eu)

The paper poster should be hung up in your office to act as a reminder that in every action you take, you need to ask yourself how you can integrate heat stress issues.



This brochure sets out information about heat stress and how to minimize the impacts this can have on local people. It supports local authorities in making appropriate decisions and select the best solutions to reduce heat stress for their particular situation. The Cool Towns project brought together 14 partners to share experience and develop climate resilient interventions to increase resilience to heat stress at street level.

It begins by explaining the concept of heat stress and how to identify the places most likely to experience heat stress by creating thermal maps and thermal walks. Examples are provided to assist in raising awareness of heat stress including a workshop guide and a library of slides from which you can choose the most appropriate to make your own presentation.

After identifying places likely to experience heat stress, the next step is to consider the options available to address this. The Cool Towns project has brought together a series of resources to help you, including a Catalog of Interventions.

This describes the different types with technical information sheets giving the advantages and disadvantages to help you make an informed decision about which might be best.

In addition, examples of completed projects are provided as case studies with detailed information including indicative costs for installation and maintenance as well as reactions from the public. We hope these will serve as an inspiration to you.

The end point of the process is to develop a city-wide heat resilience strategy so that action can be taken to reduce heat stress at street level wherever it is needed to improve the health and well being of residents.

The six steps to make your city heat resilient are provided in more detail in the following sections, as set out below.

## 6 steps to make your city heat resilient

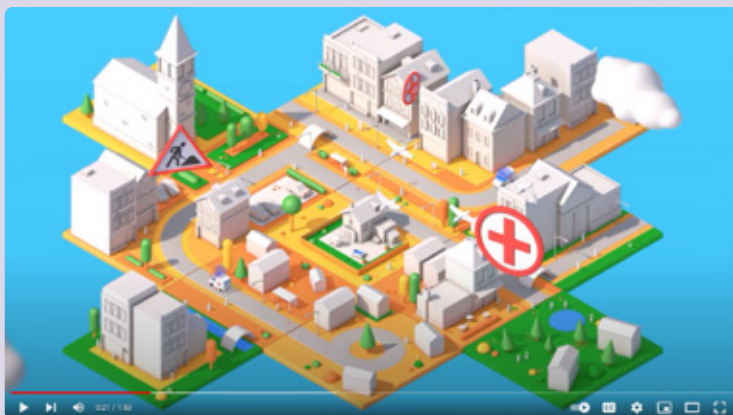
1. What is heat stress ?
2. What places have heat stress potential ?
3. How can heat stress be reduced ?
4. What is the best option to reduce heat stress in your area ?
5. Case studies
6. Developing a city-wide strategy

## STEP I : What is heat stress ?

Cities around the world are experiencing more frequent heatwaves and these are becoming more intense and lasting longer.

This is affecting people's health and if they feel too hot this affects their enjoyment of outside spaces both during the day and the evening.

### Introductory video



This [short animated film](#) explains what heat stress is and what the Cool Towns project has done to help towns and cities reduce heat stress.

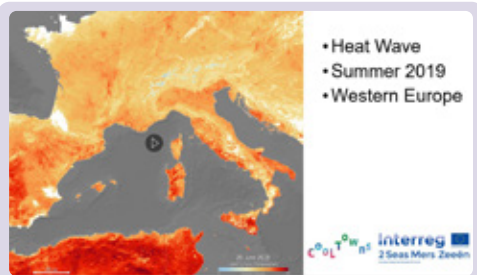
## Definition of heat stress

When a human body's ability to tolerate high temperature has reached a point where thermal discomfort begins, this is described as experiencing heat stress.

Climate change, due to anthropogenic activities, causes extreme heat events in summer. It has serious acute and

chronic health consequences and increased death rates are recorded during heat waves. It is uncomfortable and has physical and psychological effects and the young, elderly and those with existing health conditions are particularly vulnerable.

## The importance of raising awareness



Raising awareness on different levels is important. Not just among residents, although this is important to ensure support for policies, but also amongst politicians and the various levels of administration who decide on priorities. Raising awareness of heat stress and the potential consequences makes it easier to gain commitment for time and monetary resources to be allocated to developing a heat resilient strategy and ensure action is taken."

**The modular presentation can help you to raise awareness – select slides to make your own presentation tailored to your situation and the intended audience.**

## STEP 2 : What places have heat stress potential ?

Here you will find guidance to identify the types of places in your town or city, such as public squares or narrow shopping streets where people are most likely to experience heat stress during hot weather.

This will help you to prioritize places where people may be particularly vulnerable to heat stress and so where an intervention to mitigate heat stress would be most useful.



### Presentation of the workshop

To help you decide what types of places in your city might be vulnerable to heat stress you could carry out a workshop with local stakeholders. This would enable them to take part in identifying places likely to be hot and so where interventions to mitigate heat stress might be most effective. The instructions for the workshop provide a 3-step process and completing this will actively involve participants in the decision-making journey:

- › **Step 1**  
Recognising that a particular place is hot and that this affects a significant number of people in hot weather.
- › **Step 2**  
Understanding why the identified place is hot.
- › **Step 3**  
Identifying options to mitigate heat stress in the location.

## Thermal walk

A thermal walk is a procedure used to map the hot spots and is an effective method for professionals such as urban planners as well to explore and understand how greenery, space, and water affect human thermal comfort.

Guidance is given on how to conduct this, walking a route recording : a) the characteristics of each site (shade pattern building geometry and greenery for example), b) asking those taking part their thermal experience in different places (for example by using a questionnaire, and c)

recording the temperature using a thermal imaging camera to demonstrate the differences in temperature of environmental materials.



## Measurement protocol

Towns and cities are facing more frequent heatwaves of increasing intensity discouraging people from using urban open spaces that are part of their daily lives. Climate proofing cities is an incremental process that should begin where it is needed using the most cost-efficient solutions to mitigate heat stress. However, for this to be achieved the factors that influence the thermal comfort of users, such as the layout of local spaces, their function and the way people use them needs to be identified. There is currently little evidence on the effectiveness of heat stress interventions in different types of urban space.

**The Cool Towns Heat Stress Measurement Protocol addresses this by providing guidance to enable a full Thermal Comfort Assessment (TCA) to be conducted at street-level.**

Those involved in implementing climate adaptation strategies in urban areas,

either in re-developments or making improvements to existing areas, will find practical support to identify places where heat stress may be an issue and suggestions for effective mitigation measures. Practical instructions are provided on how to use weather stations to measure the effectiveness of different features in reducing heat stress and so increase thermal comfort. This provides evidence-based justification for the selection of different cooling interventions for example trees, water features, and shade sails, for climate proofing urban areas.



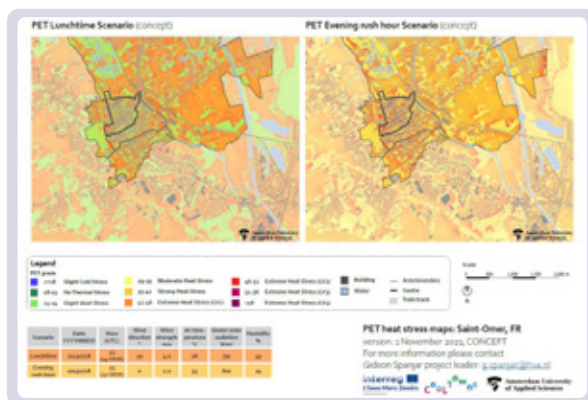


## Thermal maps

The function of a thermal map is to identify the need of heating, or in Cool Towns' case, cooling of a geographical area. They show where heat builds up in hot periods, indicating temperature differences between places.

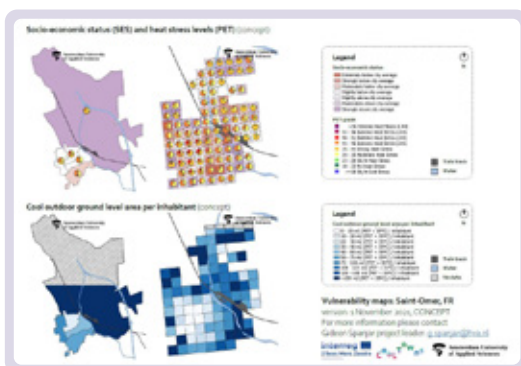
Although some work on the mapping of heat stress has been done in few European countries, the maps available are mostly static, outdated and in low-resolution.

One of the objectives of the Cool Towns project is to produce and develop high quality thermal maps for the partner's pilot locations to demonstrate how heat stress can be mitigated by introducing green or blue infrastructure or artificial shading.



## Vulnerability maps

The thermal maps created will be enhanced by adding data on concentrations of vulnerable people, for example schools, hospitals, or retirement homes in a Geographic Information System (GIS). This has been provided by pilot partners as a demonstration that can be followed in your town or city to help to set priorities for heat stress intervention.

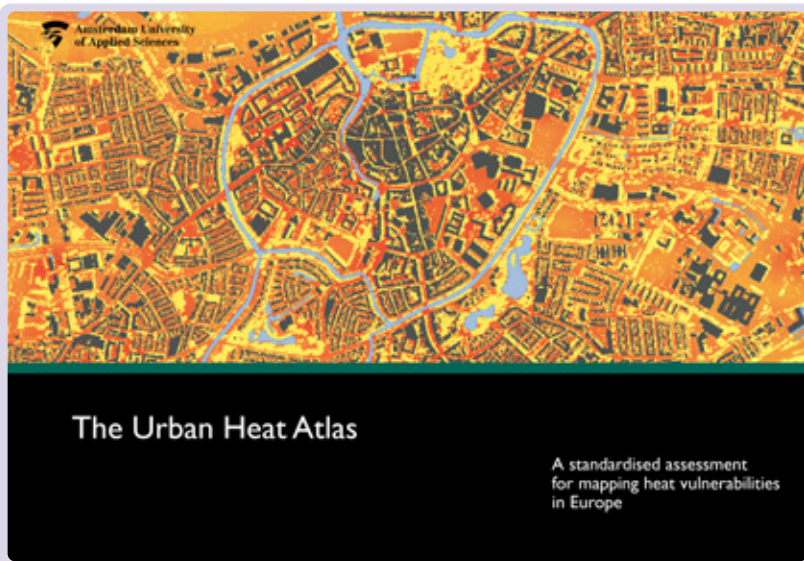




## The Urban Heat Atlas : A standardized assessment for mapping heat vulnerabilities in Europe

With increase in awareness of the risks posed by climate change and increasingly severe weather events, attention has turned to the need for urgent action. While strategies to respond to flooding and drought are well-established, the effects - and effective response - to heat waves are much less understood. As heat waves become more frequent, longer-lasting and more intense, the Cool Towns project provides cities and municipalities with the knowledge and tools to become heat resilient. The first step to developing effective heat adaptation strategies is identifying which areas in the city experience the most heat stress and who are the residents most affected. This enables decision-makers to prioritise heat adaptation measures and develop a city-wide strategy.

The Urban Heat Atlas is the result of four years of research. It contains a collection of heat related maps covering more than 40,000 hectares of urban areas in England, Belgium, The Netherlands, and France. The maps demonstrate how to conduct a Thermal Comfort Assessment (TCA) systematically to identify heat vulnerabilities and cooling capacity in cities to enable decision-makers to set priorities for action. The comparative analyses of the collated maps also provide a first overview of the current heat resilience state of cities in North-Western Europe.



## STEP 3 : How can heat stress be reduced ?

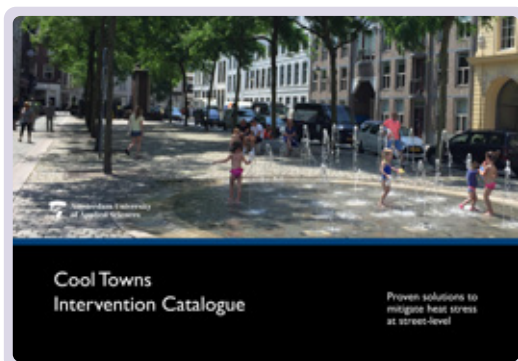
There are many ways in which heat stress can be reduced – but which is most suitable for your situation?

Some strategies, such as reducing traffic, may be challenging, and avoiding the street canyon effect requires urban planning to take a long-term view but benefits can be realized from individual interventions.

Here is a catalogue of different types of intervention, with illustrations, to help you decide which is the most appropriate for your situation.

### Catalogue of interventions

To help decision makers to choose between possible interventions that can reduce heat stress, a literature review was carried out and the findings of previous research have been summarized to produce a catalogue of interventions, which describe the advantages and disadvantages of the different options. This was developed by the Cool Towns Project so that local authorities who want to install heat stress mitigation interventions in their city can compare and contrast these and make an informed choice about which option will be best for their situation.



## The document : “ Keep your house cool ”

The past summers we had to deal with regular heat waves. Temperatures can also rise indoors, this can lead to health and problems with general well-being. Fortunately there are a number of measures that can be applied to prepare homes for hot summers. This communication kit can serve as inspiration to help individuals on their way with concrete tips and tricks to keep their home cool. This kit contains an informative brochure, sample texts for an information sheet and newsletter, examples for social media posts, banners, etc. The

content and images of this kit can be used by local authorities.

*(only available in Dutch)*



## Information note on heat resilience of private dwellings

In the near future, the need for cooling buildings will increase substantially. In order to create a pleasant indoor climate in homes, we must therefore limit overheating as much as possible.

*(only available in Dutch)*

This information note focuses on the measures and techniques that can be used to cool the interior of houses and prevent them from becoming unpleasantly hot.

This document is a guide for those who provide sustainable building advice to private homeowners. Construction professionals, contractors, architects, and private individuals who need in-depth information on this subject can also benefit from this document. Taking steps at the design/build stage to reduce the requirement to cool homes as well as different post construction cooling techniques are described in detail. For each one the impact on internal building temperature, user behaviour and any potential misconceptions are discussed.



**STEP 4 :** What is the best option to reduce heat stress in your area ?

Here are fact sheets providing data on the cooling effect of each intervention type.

The additional co-benefits of each intervention, such as reducing surface water flooding and benefiting biodiversity, as well as indicative costs, are provided along with evidence of the effectiveness in reducing heat stress.



## Technical data sheets

In the Intervention catalogue you will find technical fact sheets giving a range of detailed examples of the effectiveness of different interventions in reducing heat stress.

This will help you choose which is most appropriate for your specific site.



## STEP 5 : Case studies

Here you will find some examples of completed projects using different interventions and in different situations in cities and towns across the 2 Seas region.

These include comments on financial implications, public acceptability, lessons learnt and links for further information.

### Case study template

The case studies provide practice-based examples of heat stress interventions in public spaces.

Each case study presents a specific site where heat-stress mitigation interventions were applied. These describe the decision-making journey, the implementation process, and the data on the heat reduction impact of the different interventions. These serve as examples for other cities facing similar challenges and seeking solutions.

The collection of case studies covers a diverse range of sites and interventions from Cool Towns pilots and other sites to inspire cities that wish to cool their public spaces.

## STEP 6 : Developing a city-wide strategy

There are global, European, and national level policies that are encouraging regions, towns and cities to create strategies for climate resilience and adaptation.

These provide the context so that opportunities can be identified, partners can be engaged, and funding can be secured, to include heat stress mitigation in local development plans and strategies within each area. This also allows local or neighbourhood action plans to be developed.

## Review of policy context

This provides an overview of the existing legislative and policy framework on climate issues, at all scales (international, European, national, regional and local) that focuses on heat stress issues. It shows how local authorities can act by integrating these objectives in their heat resilient strategies, and also participate in improving this existing framework.

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## Heat resilient strategy

Each Cool Towns pilot city has developed a specific heat resilient strategy, following the six steps set out in this Roadmap.

Take a look at these strategies for inspiration and to help you to think about developing your own strategy.

### SAINT-OMER

## STRATÉGIE DE RÉSILIENCE FACE AU STRESS THERMIQUE



### COOL TOWNS

Projet pilote - 2 villes

#### ECOLE MONTAGNE

Renaturation d'une cour d'école, de deux rues et d'une aire de jeux. Prise en compte du stress thermique et de la gestion alternative des eaux pluviales.



#### ETUDE URBAINNE HALLE AUX CHOUX

Etude urbaine pour concevoir un futur quartier en renouvellement urbain à proximité de la Station à Saint-Omer-Forte pour en compte de l'enjeu de l'eau et des questions bioclimatiques.



### ACTIONS RÉALISÉES

#### 1. STRESS THERMIQUE, DE QUOI PARLE-T-ON ?

- Sensibilisation des équipes pédagogiques, des services techniques de la ville de Saint-Omer et des entreprises travaillant pour la ville à travers le processus de conception.

Participation à une journée de visite des cours d'école rénovées à Lille, organisée par l'association ADOPIA.

Intervention de l'IAUD lors d'un webinaire sur les îlots de chaleur organisé par l'Université Picardie Jules Verne pour présenter l'avancement du projet pilote (juillet 2021).

Intervention de l'IAUD au Forum national des eaux pluviales à Lens, France pour présenter le projet pilote et ses enjeux en termes de sensibilisation et de partenariat (novembre 2021).

- La ville de Saint-Omer et l'IAUD ont organisé une visite du site du projet pilote dans le cadre de la Journée mondiale de l'eau (mars 2022).

Intervention de l'IAUD lors de la réunion du réseau régional d'adaptation au changement climatique pour présenter le projet Cool Towns et la feuille de route (avril 2022).

- Intervention de l'IAUD lors d'un webinaire sur les îlots de chaleur, la végétalisation et la qualité de l'air, organisé par l'association APPA (juin 2022).





