

Alterações climáticas nas cidades: “Adaptar, mitigar ou sofrer”

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SESSÃO 4

TEMA: Implementação da Mitigação e da Adaptação às Alterações Climáticas



Instituto de Geografia
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ZEPHYRUS

Climate Change and Environmental Systems

1. Que escolhas devemos fazer para fazer frente às AC?

John Holdren, President of the American Association for the Advancement of Science

- ⌘ ***'We basically have three choices – mitigation, adaptation, and suffering.'***
- ⌘ ***'We're going to do some of each. The question is what the mix is going to be.'***
- ⌘ ***'The more mitigation we do, the less adaptation will be required, and the less suffering there will be.'***



2. Quais são os custos de inação?

- Mais incertezas que certezas
- Estudos económicos revelam que os custos da inação superam os custos da adaptação prévia

Economics of Adaptation to Climate Change



News (http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,pagePK:34382~piPK:34439~theSitePK:4607,00.html)

FEATURE STORY

Economics of Adaptation to Climate Change

June 6, 2011



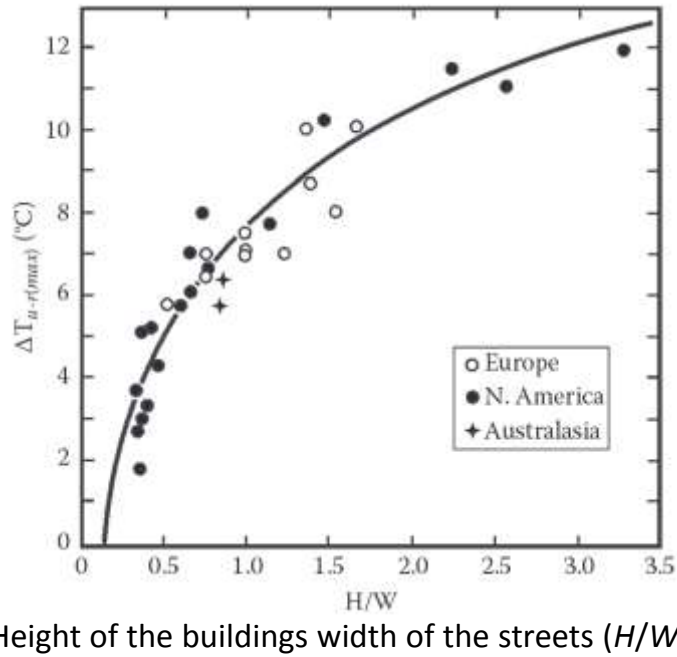
RELATED

- WORLD BANK
Economics of Adaptation to Climate Change
 - EACC - Social Synthesis Report
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 - EACC - Vietnam
 - Climate Change and the World Bank
- Keywords:
Climate Change

*...the cost between 2010 and 2050 of adapting to approximately 2°C warmer world by 2050 is in the range of **\$70 billion to \$100 billion** a year.*

Oke (1987)

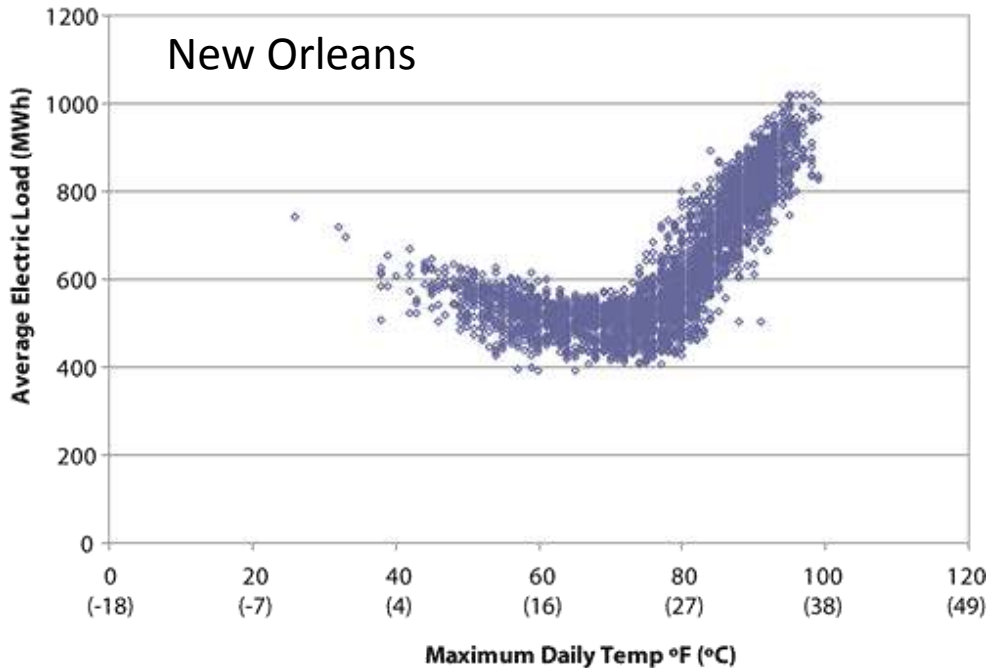
Intensidade da Ilha de Calor Urbana



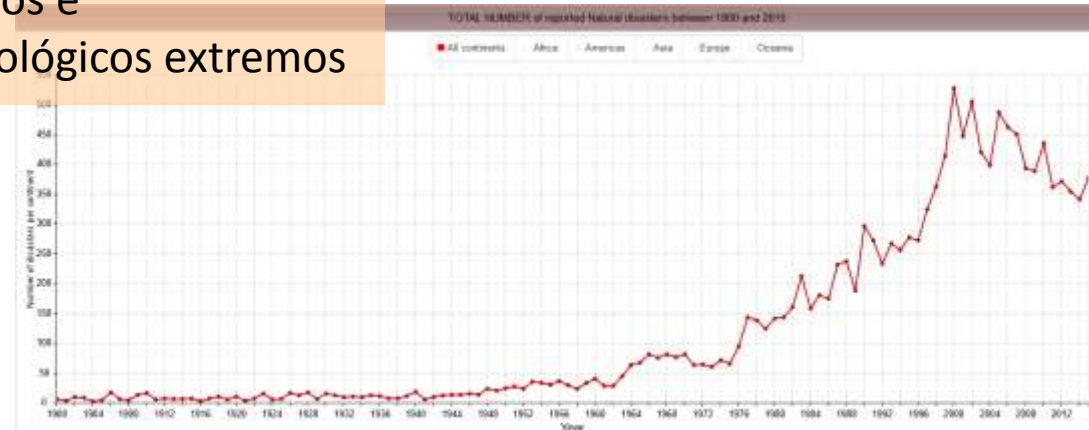
- Aumento da temperatura do ar e do efeito Ilha de calor (Urban Heat island).
- É necessária mais energia para arrefecimento dos espaços interiores.
- Aumento da mortalidade e morbidades durante a ocorrência de ondas de calor.
- Segundo a EMDAT, desde 1900 quase 30 000 000 de mortes devido a fenómenos climáticos e meteorológicos extremos



The number of annual deaths in the UK that occur as a result of the heat will rise by 257% by 2050



Sailor (2002)





3. Quais as melhores estratégias de adaptação às AC?



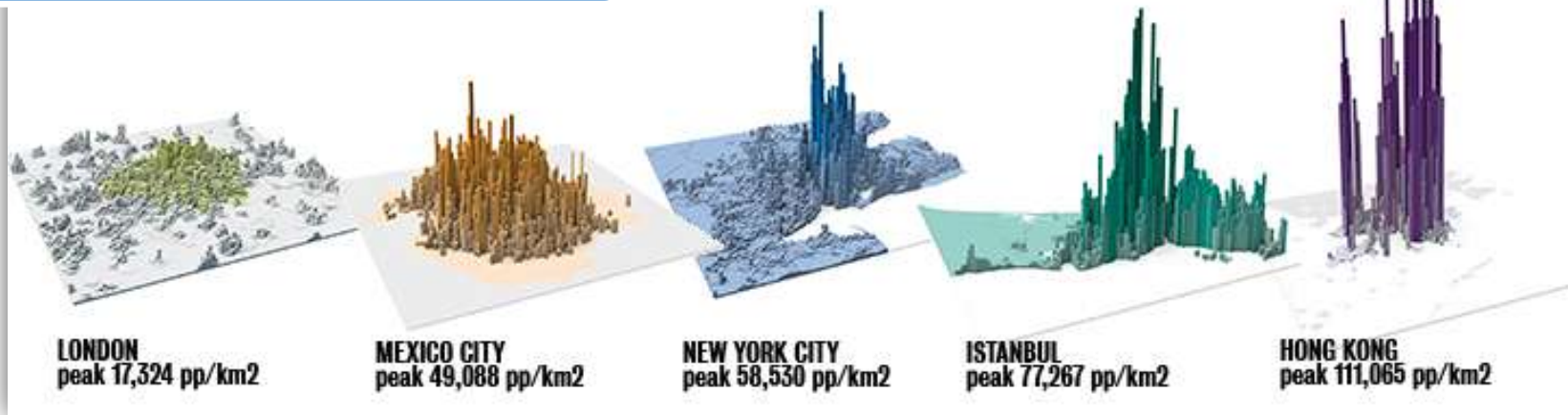
Planeada - Resulta de uma deliberada opção política, baseada na percepção que determinadas condições foram modificadas, ou estão prestes a ser, e que existe a necessidade de actuar de forma a regressar, manter ou alcançar o estado desejado.

Várias tipologias de tipologias de adaptação das sociedades às AC

The IPCC distinguishes several types of adaptation (IPCC TAR, 2001):

- **Anticipatory Adaptation**—Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.
- **Autonomous Adaptation**—Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.
- **Planned Adaptation**—Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.
- **Private Adaptation**—Adaptation that is initiated and implemented by individuals, households or private companies. Private adaptation is usually in the actor's rational self-interest.
- **Public Adaptation**—Adaptation that is initiated and implemented by governments at all levels. Public adaptation is usually directed at collective needs.
- **Reactive Adaptation**—Adaptation that takes place after impacts of climate change have been observed.

4. Act local? Todos os lugares são diferentes...



The Walkie-Talkie



At 20 Fenchurch Street is a remarkable building by Rafael Violy; clad in glass, its floor space increases with height to maximise the value of office space... **The intensity of the solar energy was sufficient to melt parts of a Jaguar car, to singe carpet in a barbers shop and even to cook eggs.**

5. Cidades inteligentes ou pessoas inteligentes? Como aplicar efetivamente medidas de adaptação às AC nas escalas locais?

“Cities consume 75 per cent of worldwide energy production and generate 80 per cent of CO2 emissions”



•smart
economy

•smart
mobility

•smart
environment

•smart
people

•smart
living

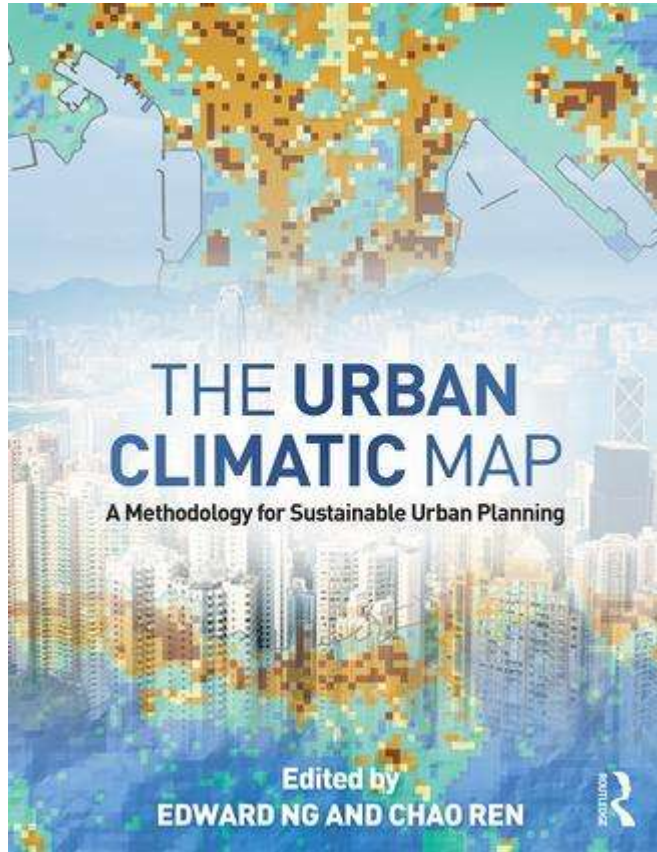
•smart
governance



<http://smartcities.ieee.org/about>

Uma nova “escala” de análise: a escala digital

6. A opção “Planeamento e Ordenamento do Território”.



Chapter 16

Urban climatic map studies in Portugal

Lisbon

Maria João Alcoforado, António Saraiva Lopes and Henrique Andrade¹

Chapter 17

Urban climatic map studies in Brazil

Campinas

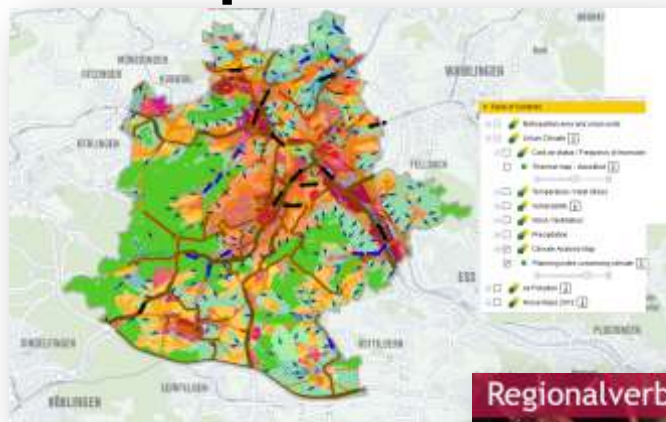
Alessandra R. Prata Shimomura, António Saraiva Lopes and Ezequiel Correia



Figure 1. UCMap studies around the world. This figure is available in colour online at wileyonlinelibrary.com/doi/10.1080/00141801.2014.950000

The urban climatic map (UCMap) is an information and evaluation tool to integrate urban climatic factors and town planning considerations by presenting climatic phenomena and problems into two-dimensional spatial maps (Ren et al, 2010).

Alguns exemplos de informação climática local na Europa



Stuttgart

A screenshot of the website for Regionalverband Ruhr. The page features a navigation bar with categories like 'STARTSEITE', 'LAND & LEUTE', 'TIPPS & TERMINE', 'FREIZEIT & SPORT', 'KULTUR', 'WIRTSCHAFT', 'WISSENSCHAFT & BEWEGUNG', 'BAUTENWERKE & GEOPORALE', 'PREISREISEN', and 'KONTAKT & ANFRAGE'. The main content area is titled 'Umwelt & Freiraum' and includes a section for 'Klimaserver - Klima-Infos im Ruhrgebiet'. This section provides information about climate data for the Ruhr region, including a map and contact details for the Regionalverband Ruhr. The contact information includes the address 'Klimaserver Ruhr, Postfach 10 15 50, 45133 Essen', phone number '+49 (0) 201 / 209-276', and fax number '+49 (0) 201 / 209-480'. There is also a 'KONTAKT' button.

Berlin

A screenshot of the Berlin Environmental Atlas website. The page is titled 'Berlin Environmental Atlas: 04.12 Future Climatic Change and Thermal Load (Edition 2010)'. It features a navigation menu on the left with categories like 'Introduction', 'Topics', 'Level of Works', 'Participants', 'Contact', 'Copyright', and 'Help'. The main content area displays a grid of six maps showing thermal load data for different periods and scenarios. The maps are labeled with codes such as '4.12.1 Annual Mean Number of Thermal Load Days (1971-2000)', '4.12.2 Increase in the Number of Thermal Load Days (2021-2050)', '4.12.3 Increase in the Number of Thermal Load Days (2071-2100)', '4.12.4 Total of Thermal Load Days for the (1971-2100) Period', '4.12.5 Total of Thermal Load Days for the 2021-2050 Period', and '4.12.6 Total of Thermal Load Days for the 2071-2100 Period'. The maps use a color scale from green (low thermal load) to red (high thermal load) to indicate the intensity of thermal load.

Exemplos de estudos em Portugal

1. Lisboa (2005)

URBANISMO

- NOTÍCIAS
- PEDIDOS AOS SERVIÇOS
- PERGUNTAS FREQUENTES



PLANEAMENTO URBANO

- Plano Diretor Municipal
- Planos Eficazes

ORIENTAÇÕES CLIMÁTICAS PARA O ORDENAMENTO

A presença da informação climática na primeira geração de Planos Diretores Municipais (PDM) em Lisboa, revelou-se limitada. Na nova geração de PDMs, será claramente superiores.

Relatório **4**

ORIENTAÇÕES CLIMÁTICAS PARA O ORDENAMENTO EM LISBOA

CENTRO DE ESTUDOS GEOGRÁFICOS
ÁREA DE INVESTIGAÇÃO DE GEO-ECOLOGIA
Universidade de Lisboa
2005

Maria João Alcoforado
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Henrique Andrade
João Vasconcelos

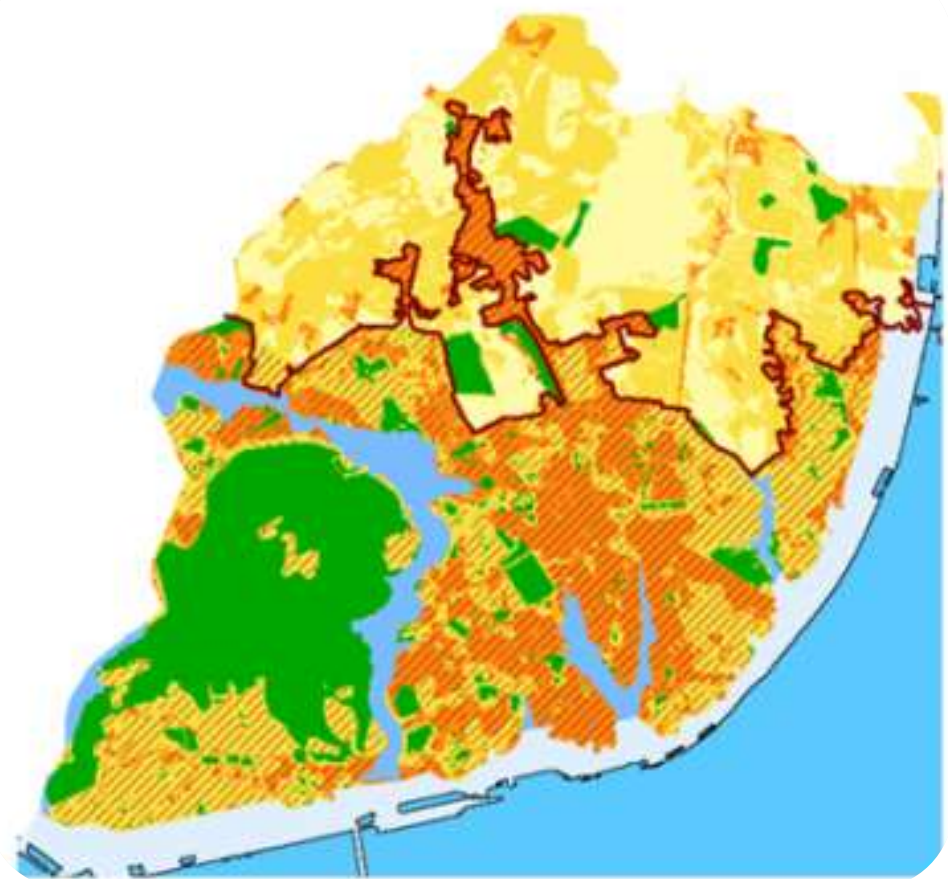


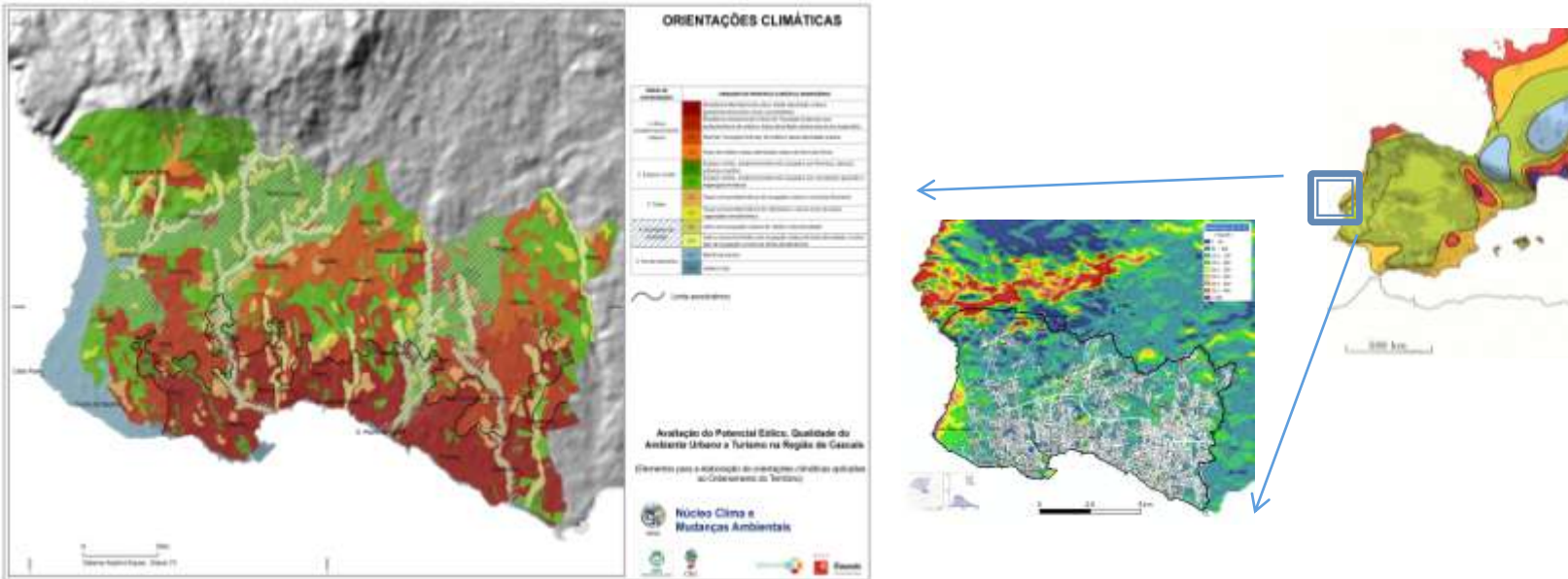
Table III - Summary of spatialized guidelines for planning in Lisbon

Grupos de climatopos	Orientações
A Área de baixa densidade de construção do Norte de Lisboa (4+5+6 na fig.16)	<ol style="list-style-type: none"> 1. Manter corredores de ventilação com orientação N-S (NW-SE a NE-SW) 2. Manter uma razão H/W ≤ 1 nas construções urbanas 3. Criar espaços verdes extensos no interior e entre as áreas edificadas
B Áreas construídas de média densidade a Sul do limite aerodinâmico (2, fig.16)	<ol style="list-style-type: none"> 1. Preservar os fundos dos vales de novas construções e da ocupação com vegetação densa 2. Manter uma razão H/W ≤ 1 nas construções urbanas 3. Criar espaços verdes de média dimensão e preencher os espaços intersticiais com vegetação
C	<ol style="list-style-type: none"> 1. Preservar os fundos dos vales de novas construções e da ocupação com vegetação densa 2. Manter nas construções urbanas uma razão H/W ≤ 1, mantendo...

- CEG:
M.J. Alcoforado;
H. Andrade;
A. Lopes;
J. Vasconcelos;
Rute Vieira

b. Cascais (2013)

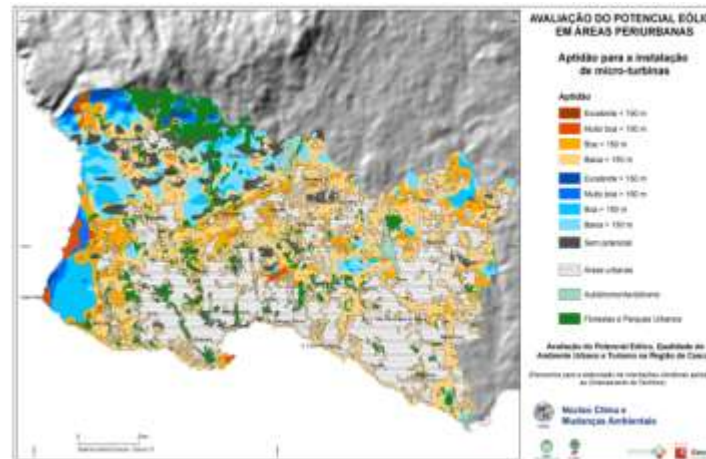
UCM (Urban Climate Maps) – Climatic guidelines for urban planning



Lopes e Correia (2013)

Potencial eólico

small wind turbines



c. Exemplo da Praia (Santiago de Cabo Verde)

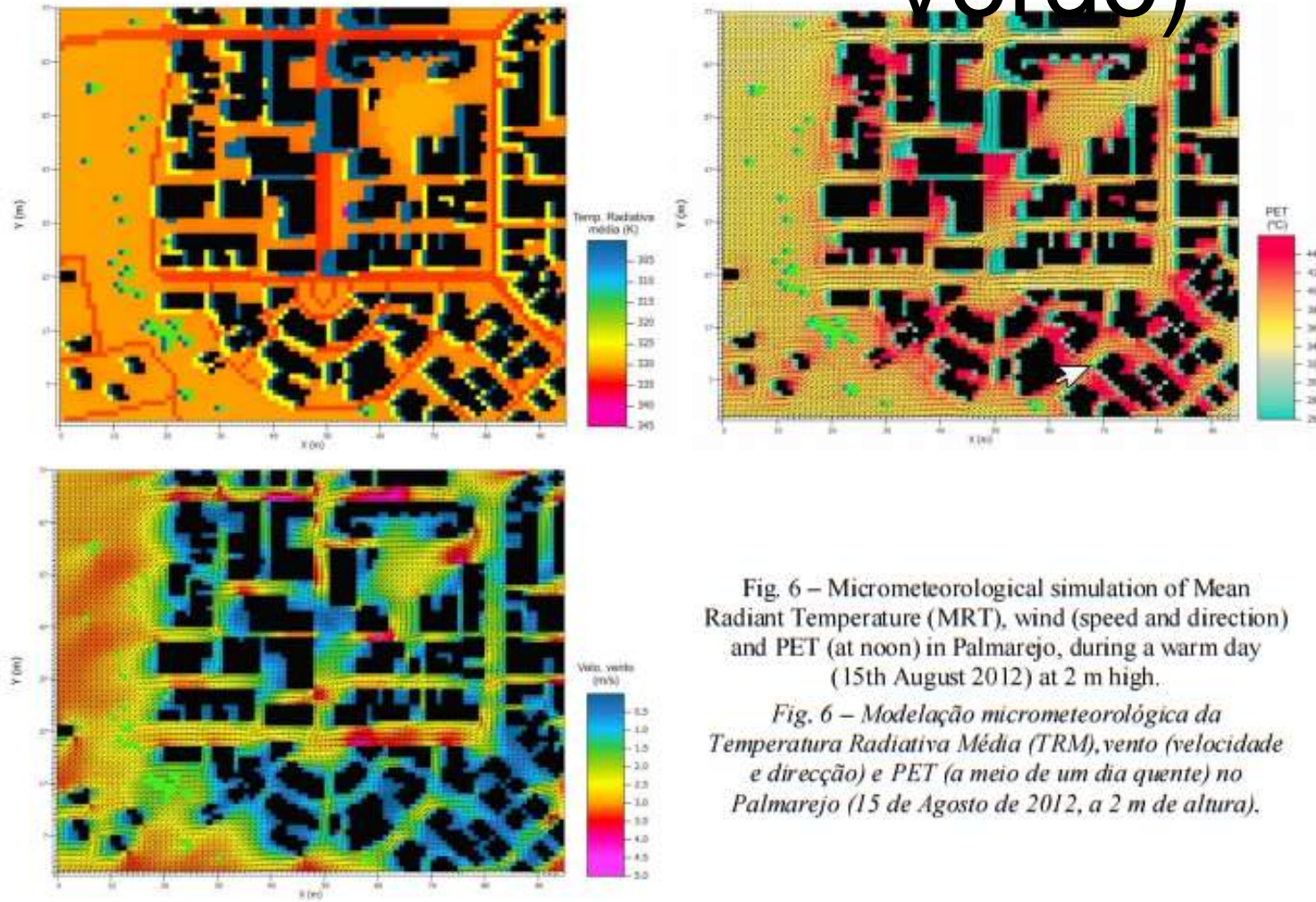


Fig. 6 – Micrometeorological simulation of Mean Radiant Temperature (MRT), wind (speed and direction) and PET (at noon) in Palmarejo, during a warm day (15th August 2012) at 2 m high.

Fig. 6 – Modelação micrometeorológica da Temperatura Radiativa Média (TRM), vento (velocidade e direcção) e PET (a meio de um dia quente) no Palmarejo (15 de Agosto de 2012, a 2 m de altura).



With the Paris climate agreement taking effect, how can we move quickly toward action?

In an interview, C40's Seth Schultz says groups like his are embarking on a long-term commitment to work directly with the research community to support sustainable urbanization.

OCTOBER 6, 2016



Seth Schultz speaks at the COP 21 talks in Paris, December 2015.
(C40)

In this interview, Seth Schultz, research director at the C40 Cities Climate Leadership Group — a network of the world's mega-cities committed to addressing climate change — talks about a new partnership emerging between science and cities. Boundaries between research and practice are dissolving in the pursuit of a common goal on sustainable urbanization. But a co-evolved approach requires stamina and long-term thinking.

- **Q: This all sounds very timely and promising, but as we know the academic community works at a different pace from the practitioner community. How to bridge this gap to develop an effective working partnership?**
- We are at a turning point. There is no question that more academic research needs to get turned into policy.
- At the same time, policymakers need to be much more aware of the science and data.
- Organizations working on coupling those two things will come into prominence.

Conclusões:

- Necessidade de estudos prévios de clima urbano atual e previsto para o futuro para escolha das medidas de adaptação mais adequadas (redução de consumos energéticos, melhoria do conforto térmico, qualidade do ar, etc).
- Verificação de potencialidades e limitações específicas de cada cidade.
- Investigação conjunta com as Universidades: “policymakers need to be much more aware of the science and data”
- Agir urgentemente com opções inteligentes.
- *Smart cities ou smart people?*



Obrigado pela
vossa atenção

