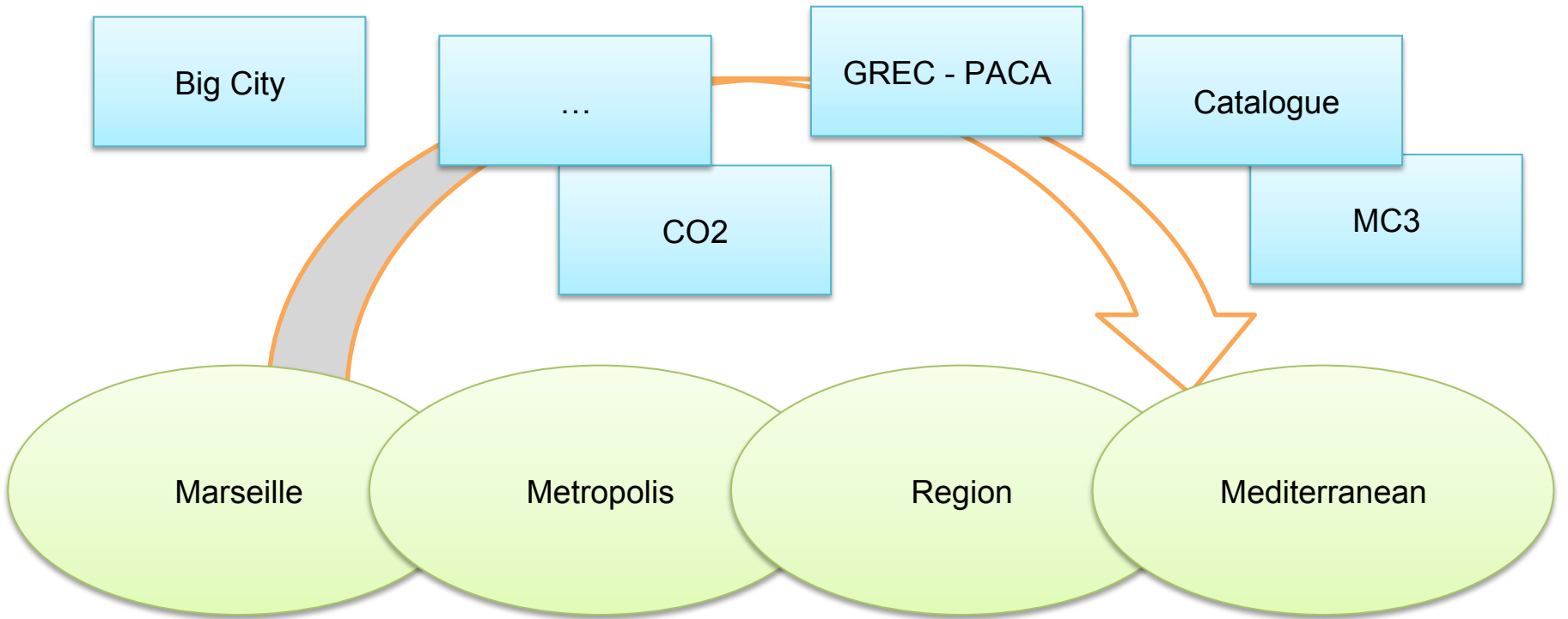


# Mediterranean Cities and Climate Change





We need to coordinate-integrate programs at various scales  
LABEX: Visibility for our own competencies

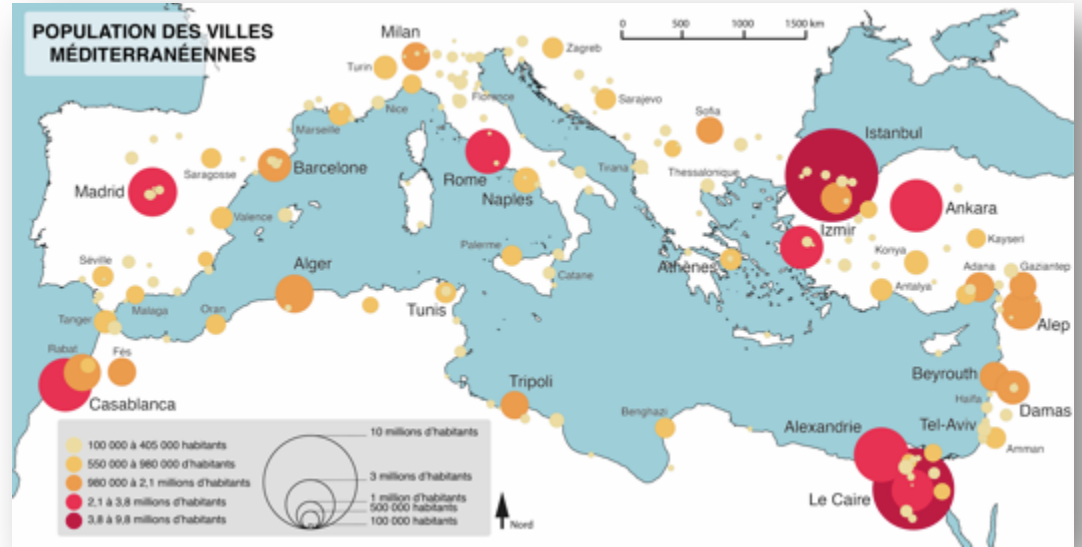
- The city is at the **origin of 70 % of greenhouse gas emissions**: industry, transport, energy, etc.
- Beyond the sectorial policies, **the structure of the city is determining**: density, green areas, materials, layout, etc.
- We do not know much about the **climatic functioning of the city**
- An urban policy means an **integrated vision of the city including governance and participation**



Actions on the city are essential in the struggle against the CC;  
But what means an urban policy within the framework of the  
climate change?

## The Mediterranean Urban Landscape:

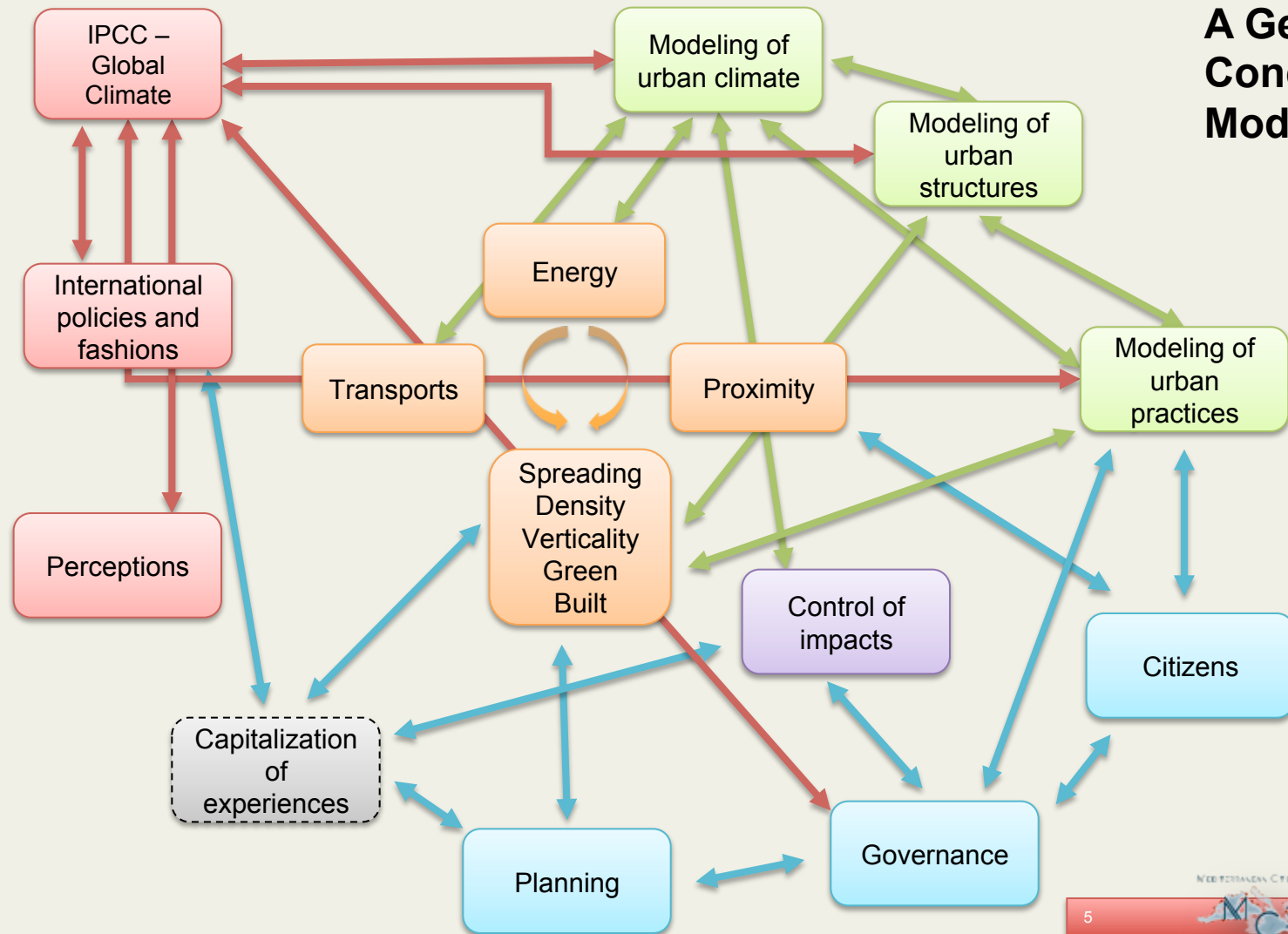
- Big Conurbations
- “Coastle-ization”
- Diffuse Cities / Urban sprawl
- Informal districts



Since the 1990s, the density of houses on coast increased by 60 %. On the basis of this observed growth, we consider that this population, in very strong expansion, could reach 524 million inhabitants in 2025.

The control of the urban expansion is a crucial challenge in a region where environmental requirements are strong.

# A General Conceptual Model



# URBAN CHALLENGES in front of CLIMATE CHANGE

From the global challenges to the action

**Thematic**

Public Policies

Scale of the Climate

Urbanism

**Problems**

Mediterranean Coordination

Regional Model

Solutions adapted to the local contexts

Cross-sector

Urban Monitoring

Integrated Solutions

From the Mediterranean to the local scale

Transition

Urban Morphology

Solutions which respect and improve the lifestyles

Planning on the long term

**Objectives**

Comparison of the experiences between agencies and communities

Link between research and action ( Training, new models, indicators, etc.)

Initiatives climate of the Mediterranean cities (Plan Climate Energy Territorial)

Regional syntheses On climate change

Intra-urban monitoring

Distribution of the climatic information and Alarm systems

The tools of the town planning in the Mediterranean Region- quantitative and qualitative analyses

Comparison of the local experiences - relation between actions pilots and planning

## Policies.... solutions on the scale of the Mediterranean Region:

There is no **specifically Mediterranean diagnosis** (IPCC, UN-Habitat, COP21, C40, etc.) **nor urban**

But of **multiple initiatives** at the national and international level ...

... Which must be even moved closer **coordinated politically and scientifically**



What international policies for the Mediterranean Region?  
What Mediterranean specificities?



## Policies ... A transformation necessary for the national and urban level :

Ecological Transition= **Political Transition**

**Urbanism** ≠ Urban Project ≠ Housing

*Ecodistrict – Sustainable City - Smart City - Resilient City...* Towards a Mediterranean transformation of devices



*Most of the governments are structured around sectorial strategies, little have a climatic agency and the place of the environment is not there priority*

Thinking the policies of town planning in relation of the climate change: an opportunity for the improvement of the living conditions?

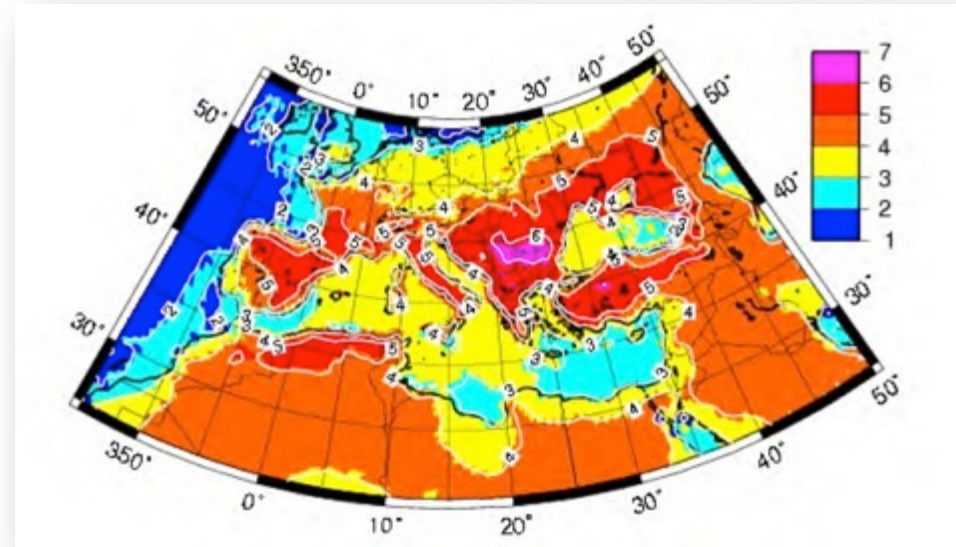


## Climate .... From the macro-model

**The regional climatic modelling: a prospective of the future climate, but insufficient for cities.**

- Compare the data of the Mediterranean institutions
- Model specifically the zone
- Give this information to the inhabitants and to the decision-makers
- Build monitoring indicators to allow an adaptation

Average variations of air temperatures in summer (°C)  
2070-2099 vs. 1961-1990

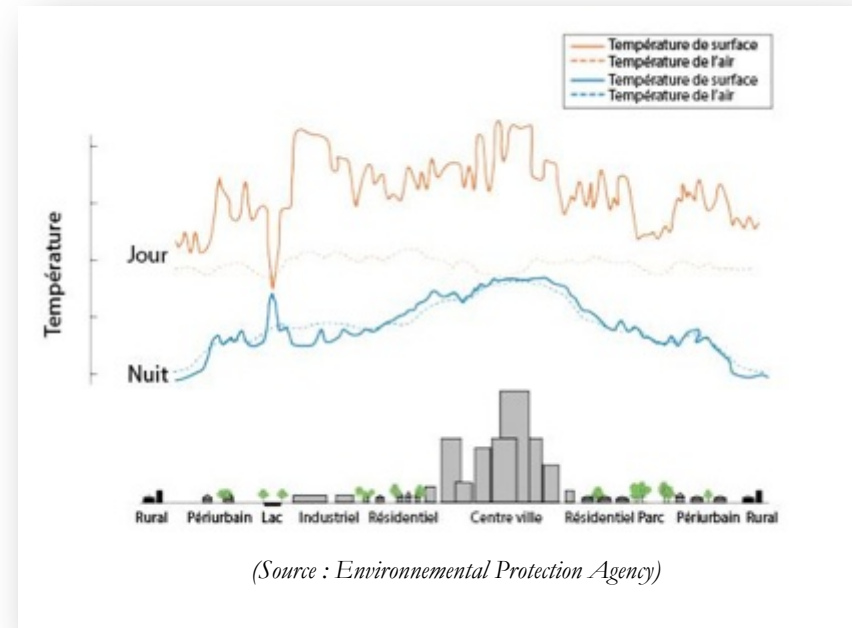


*Somot et al., 2007*

Understanding and modelling the climate in the regional scales: a solution for the adaptation to the climate change?

... Via the phenomenon of urban island of heat...

To know the spatial and temporal variability of these islands of heat will allow **the adaptation of the city in terms of morphology, energy policy, use of materials, layout of the green spaces, etc.**



Modelling the climate in the fine scales: a solution to transform the city?

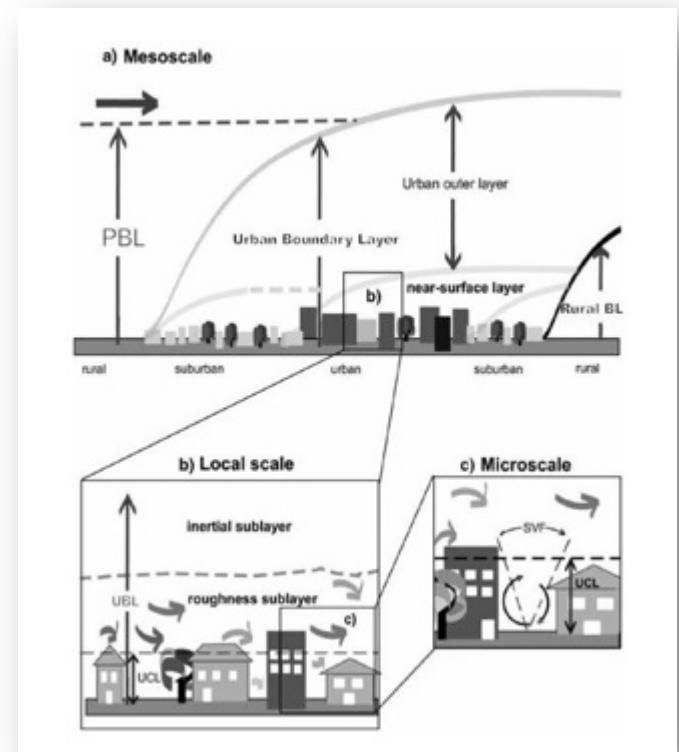
## ... to the intra-urban scale

Diversity of the local climates - specific weather and environmental conditions (Mistral, breezes, basin, etc.)

Necessary understanding of the interweavings of the spatiotemporal scales.

**Implant networks of measures in cities for a meteorological and climatic follow-up in the fine scales ...**

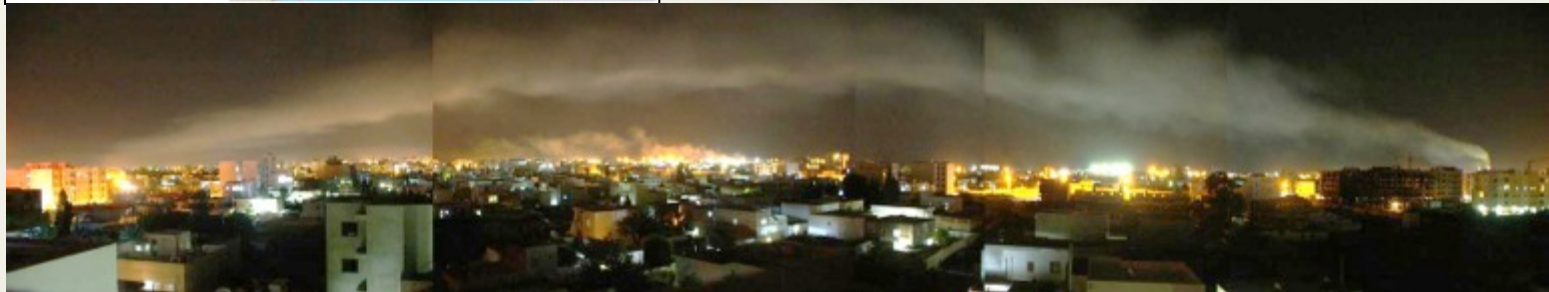
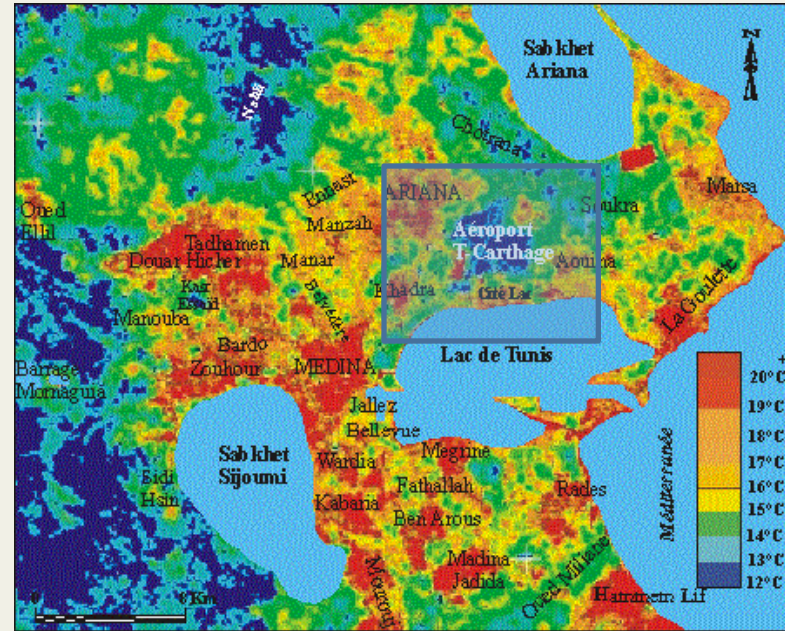
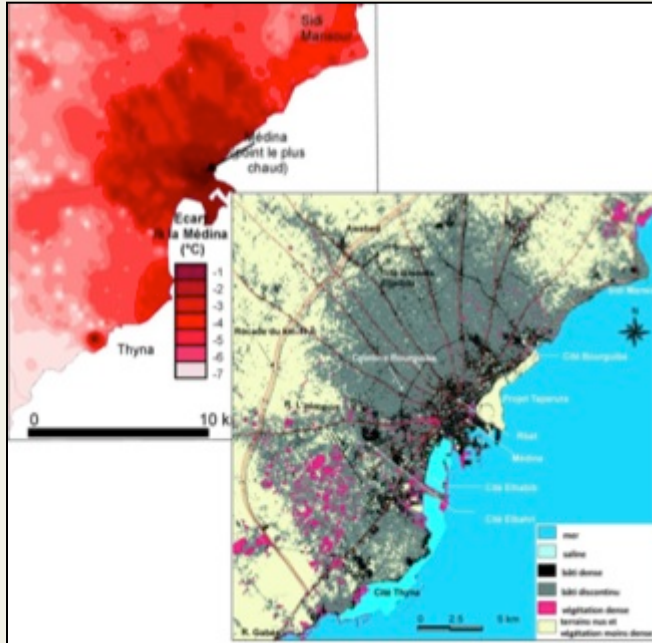
**... And propose systems of premature alert (*Heat wave, flood, seasonality, etc.*)**



*Rotach et al. 2004, adaptation of Oke, 1977)*

Measure the climate in the fine scales: a solution for the follow-up of the climatic variability in cities?

# Tunis - On the scale of the urban area



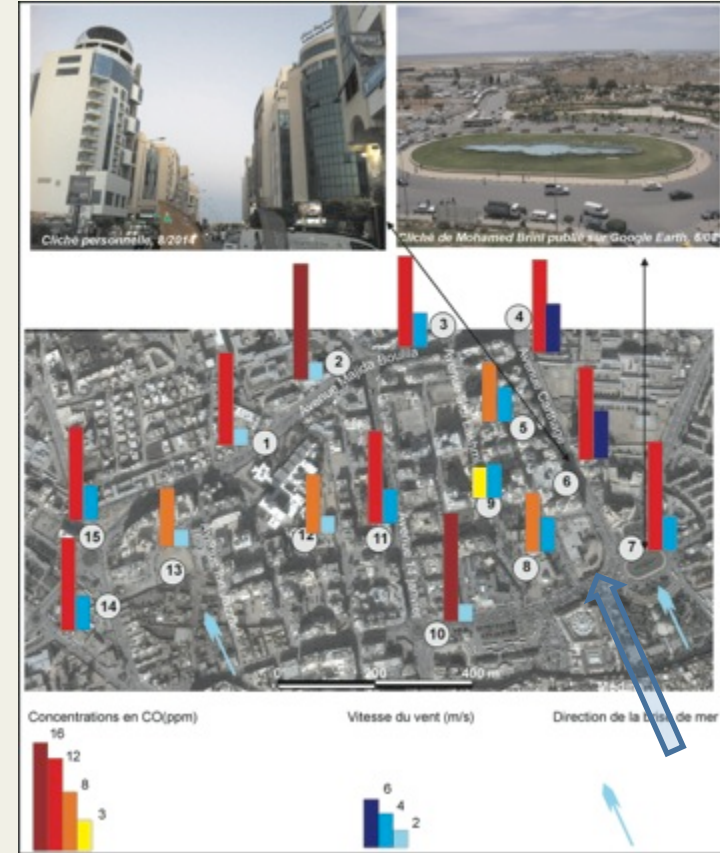
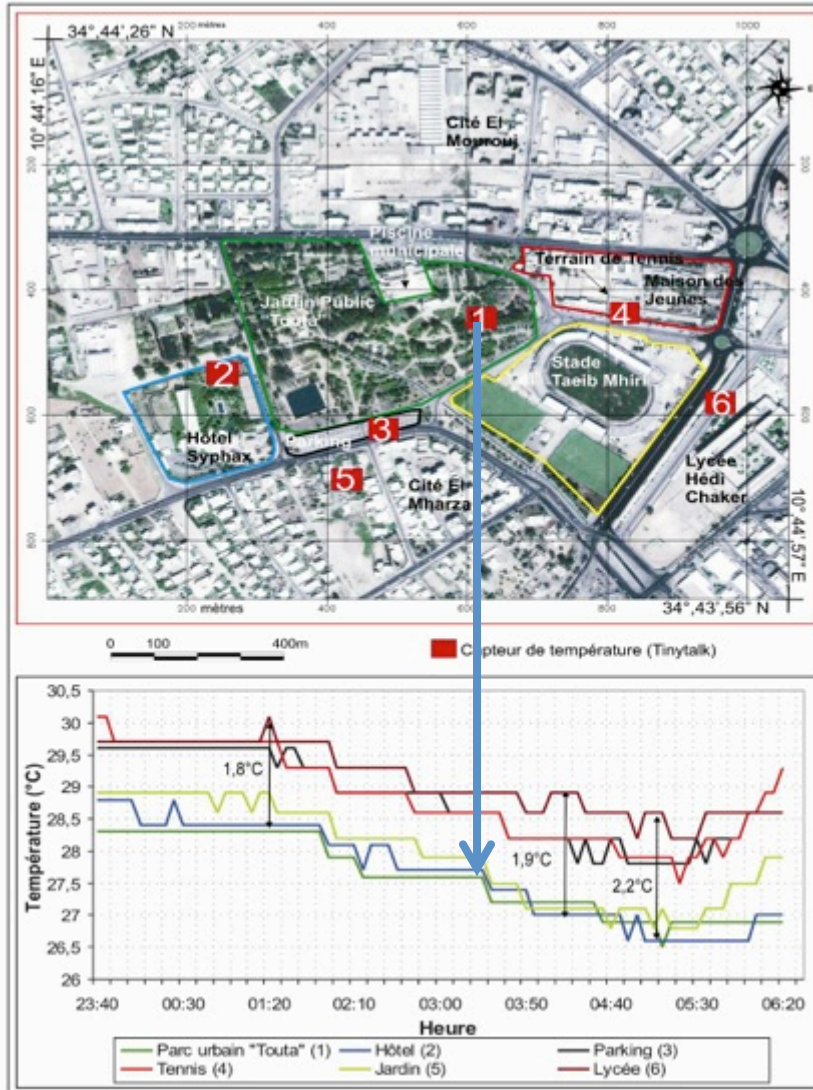
Dome of heat to be limited by the green spaces

What types of measure in the fine scales?



# At the district scale

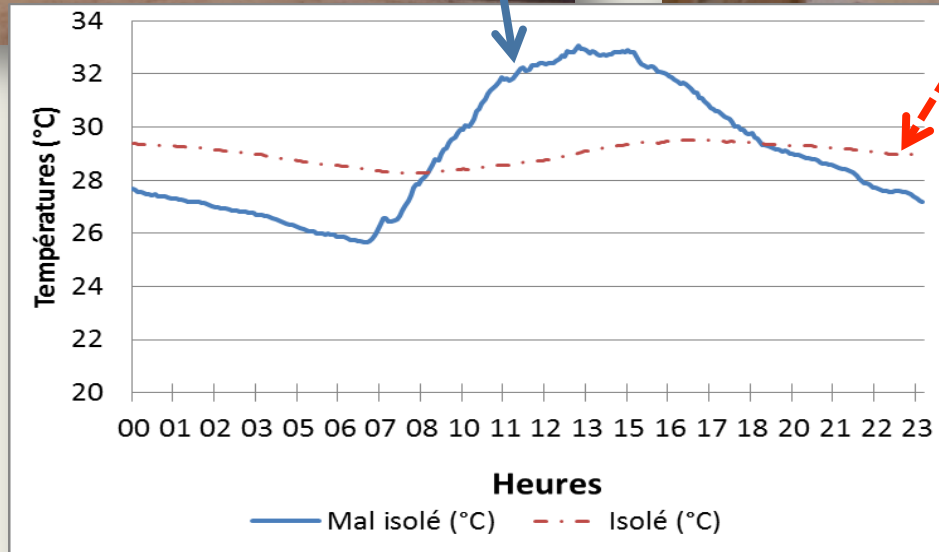
The green spaces: islands of freshness



Big arteries directed in the sense of the breeze to take advantage of the refreshing wind

# At the scale of Housing

Optimize the insulation and thoughtful colors in the popular districts



Temperatures measured inside two housing of the same exhibition(exposure) but (the one with insulation of walls, the other one not), From 04 till 20 September 2015. cadence of 5 mn by two thermo-hygrometric sensors " Testo ".

## Urbanism .... standard solutions

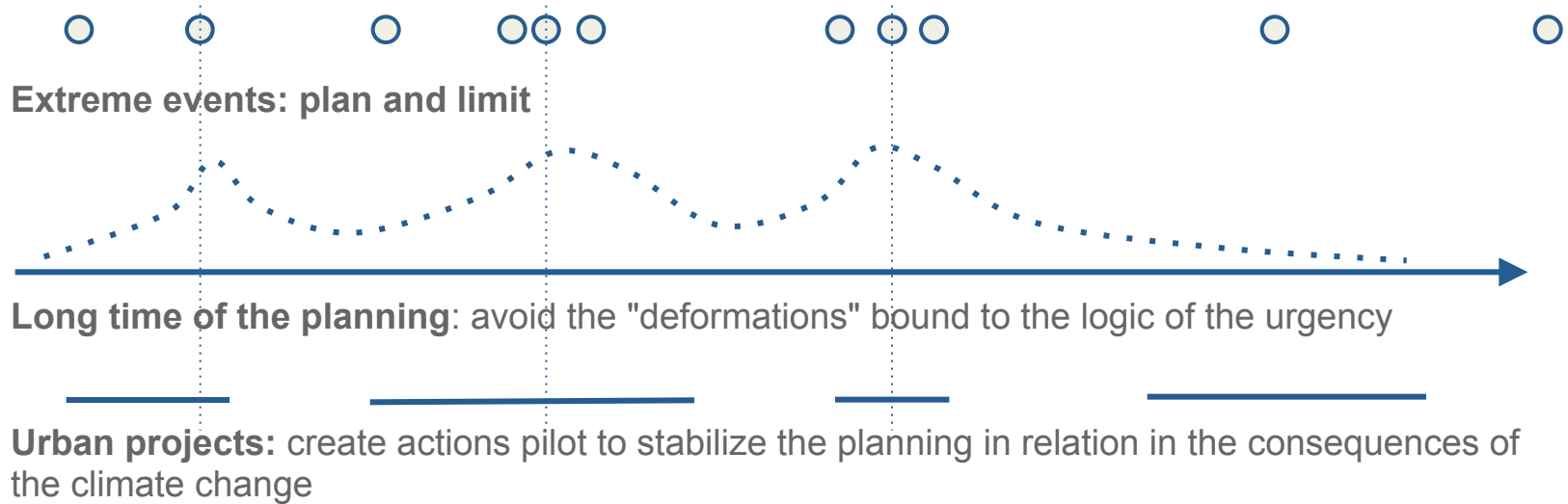
- ❖ **Densification** / Use of the Space
- ❖ **Materials and forms** to save the energy
- ❖ **Transport soft** and less polluting
- ❖ **Green spaces, roofs and vegetated facades;**
- ❖ **Management of the services** by the "smart"
- ❖ **Education** of the citizens



At present there is no research on the adaptation of these solutions to the Mediterranean region and local contexts



# Urbanism ... Timescales in the relation town planning - climate change



Articulate the scales of planning:  
A solution for the urban adaptation?

## Urbanism ... Mobilizations and micro-local solutions :

Avoid the speech of making guilty to **stimulate the initiatives**

The **integration of the solutions** which makes the civil society raises problems of scale.

Example: **the permaculture**



Knowing collective actions and studying their impact on the urban scale: a solution for the public-spirited commitment in the adaptation?

## The MC3 program wants to

**Value** the knowledge and the know-how

**Exchange** the experiences, from the research for Mediterranean solutions

**Propose** transverse analyses on the basis of the accumulated knowledge

**Interact** with networks and Mediterranean institutions by means of a platform of analysis

### Policy

- Mediterranean specificities / Action plans
- Urban / Integrated sectorial policies

### Climate

- Macro-model / Incompatible with urban scale
- Dependence to morphology, green spaces. Energy, etc.
- Modelling intra-urban / What kind of monitoring?

### Urbanism

- Adaptation of urbanistic experiences to the Medit context
- Debate on planning and project
- Mobilization of local knowledge and action for adaptation

# Know, Make known, Exchange, Innovate, Propose



AGENDA  
POSITIF  
MÉDITERRANÉEN

## Create a Mediterranean Region of projects :

- Mediterranean diagnoses by Mediterranean actors
- Exchange and coordinate the urban initiatives
- Build specific climatic models

## Act/of acting :

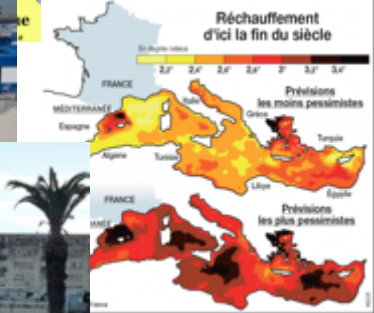
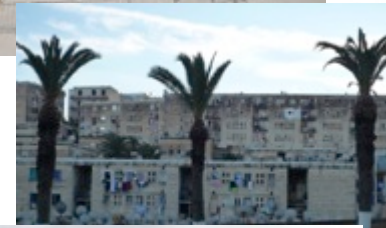
- Act on the political and ecological transition
- Implant networks of measure
- Build models of urban climate for a morphological transformation of the city

## Make of the CC an opportunity for development :

- List best practice in the urban solutions
- Take the opportunity of the CC to improve the living conditions and the sustainability
- Mobilize the actors and their solutions

## Concretize commitments :

- Create a community which exchanges, analyzes and informs
- Generate motivations for sustainable city







## A Collaborative Web Site

- Information and Journal
- Inventories
- Synthesis
- Glossary
- Networks

Accumulate the data;  
share them;  
build together analyses

## Inventories

- International
- National
- Regional
- Urban
- Local

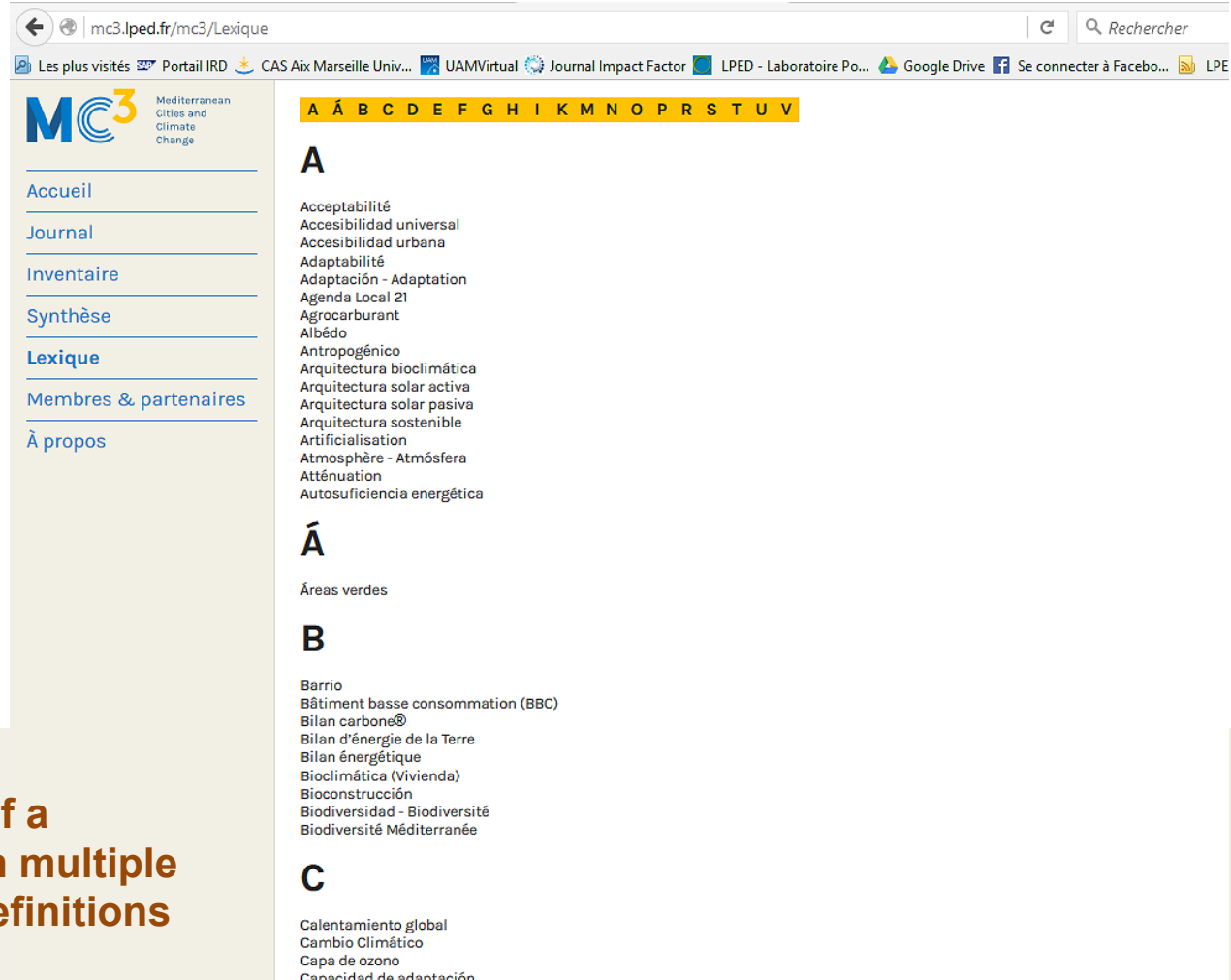
The screenshot shows a web browser at the URL [mc3.lped.fr/mc3/Barcelona](http://mc3.lped.fr/mc3/Barcelona). The page features a navigation menu on the left with categories like 'Accueil', 'Journal', 'Inventaire', 'Synthèse', and 'Lexique'. The 'Inventaire' section is expanded to show a tree structure for 'España', with 'Barcelona' selected. The main content area is titled 'Barcelona' and lists various thematic areas: 'Thématiques', 'Stratégie régionale et métropolitaine', 'Stratégies sectorielles', 'Gouvernance', and 'Programmes de soutien et de mise en réseau'. Below this, there are sections for 'Projetos' (Projects) for 'Santa Coloma de Gramenet', 'Ecobarrio Trinitat Nova', and 'Cubelles'. The 'Ecobarrio Trinitat Nova' section includes a detailed map of the site and a caption: 'El sitio del ecobarrio sur le GEA21 "Grupo de Estudios Alternativos"'. At the bottom, a map of the Iberian Peninsula shows the location of Barcelona and other cities like Madrid, Rome, and Naples.

## A Collaborative Web Site

- Information and Journal
- Inventories
- Synthesis
- Glossary
- Networks

**Accumulate the data;  
share them;  
build together analyses**

**Construction of a  
dictionary from multiple  
sources and definitions**



The screenshot shows a web browser window with the URL [mc3.lped.fr/mc3/Lexique](http://mc3.lped.fr/mc3/Lexique). The page features a navigation menu on the left with links for [Accueil](#), [Journal](#), [Inventaire](#), [Synthèse](#), [Lexique](#), [Membres & partenaires](#), and [À propos](#). The main content area displays a list of terms under the heading 'A', with a yellow navigation bar above it containing letters A through V. The terms listed include: Acceptabilité, Accesibilidad universal, Accesibilidad urbana, Adaptabilité, Adaptación - Adaptation, Agenda Local 21, Agrocarburant, Albédo, Antropogénico, Arquitectura bioclimática, Arquitectura solar activa, Arquitectura solar pasiva, Arquitectura sostenible, Artificialisation, Atmosphère - Atmósfera, Atténuation, and Autosuficiencia energética. Below this, the heading 'Á' is followed by 'Áreas verdes'. The heading 'B' is followed by a list of terms: Barrio, Bâtiment basse consommation (BBC), Bilan carbone®, Bilan d'énergie de la Terre, Bilan énergétique, Bioclimática (Vivienda), Bioconstrucción, Biodiversidad - Biodiversité, and Biodiversité Méditerranée. The heading 'C' is followed by: Calentamiento global, Cambio Climático, Capa de ozono, and Capacidad de adaptación.



## Country having participants to MC3



- A fixed **team**
- A **network** of researchers, institutions, networks
- A free and not binding **participation**



## Realization of the inventories

- International, national and local policies
- Urban projects
- Urban experiences
- National and local models of climate
- Monitoring centers and devices of measure

## Participation to the glossary

## Realization of syntheses (workshops)

- Public policies
- The devices of observations
- Temporality of the planning
- The indicators of the urban sustainable development
- .....



- Publications**
- White Book - State of the knowledge on climate change in urban zones**
- Consolidated network for follow-up and training**
- European project**





Mediterranean  
Cities and  
Climate  
Change

<http://mc3.lped.fr/>

**Hubert Mazurek**, director MC3, geographer, ecologist

**Elodie Briche**, researcher, geographer - climatologist

**Jeremy Garniaux**, manager of the project, geographer

**Federica Gatta**, researcher, architect, urbanist

**Debra Pereira**, researcher, environmental sociologist

**Mavromatidi Asimina** – Harokopio University of Athens (ERASMUS-Climatologist)

**Vincent Letourneur and Imane Madi** (Master on Istanbul new Green Projects)

and **Salem Dahech**, member of the network, geographer climatologist (University of Sfax, Tunisia, Laboratory SYFACTE)



**A\*Midex**  
Initiative d'excellence Aix-Marseille