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ADAPTATION TO CLIMATE CHANGE

The Mission Implementation Platform – #MIP4Adapt Overview

#EUmissions #HorizonEU #MissionClimateAdaptation

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Experiences from the City of Zagreb

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CITY OF ZAGREB

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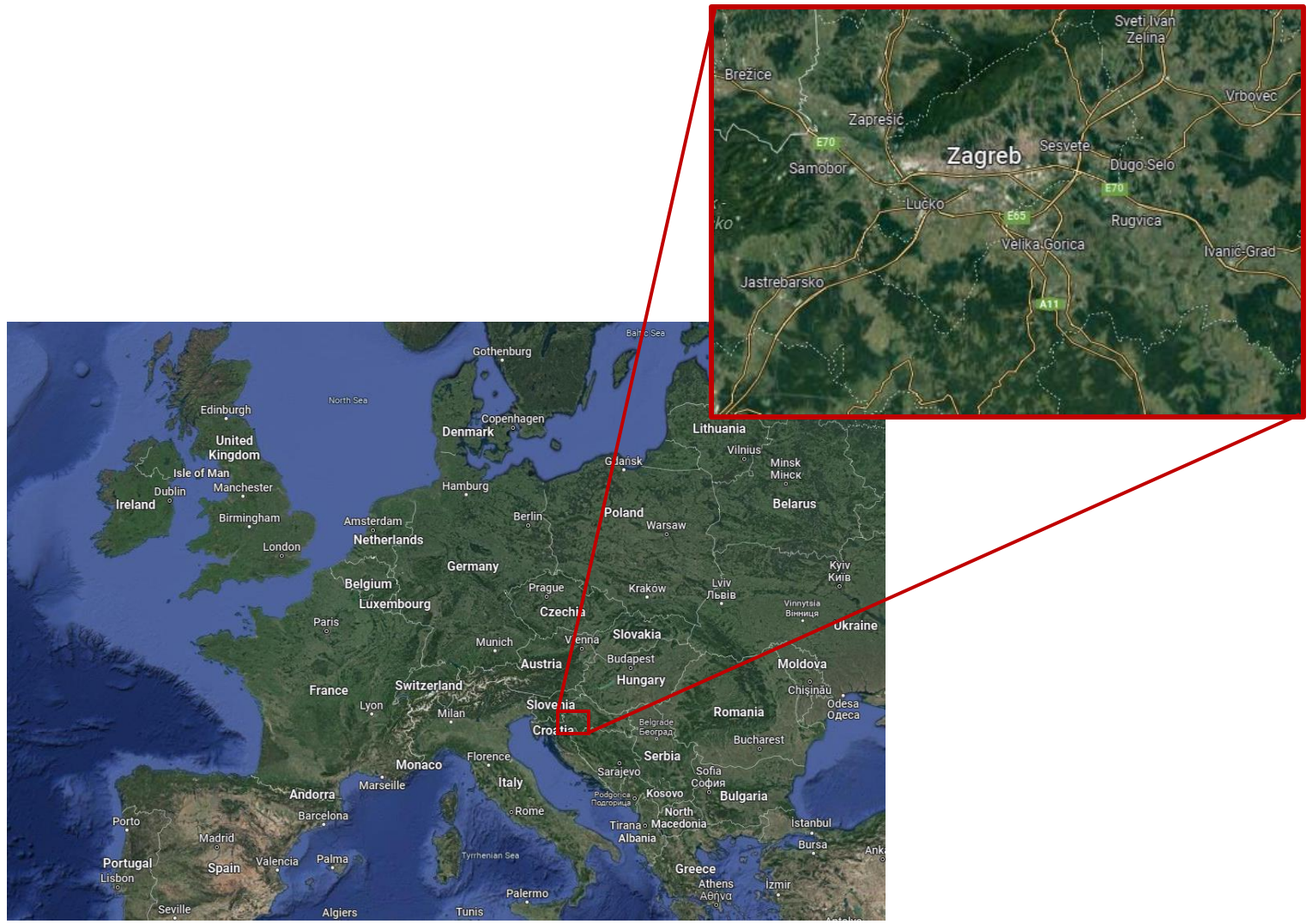
Background

- **City of Zagreb**
  - Capital of Croatia
  - 806k inhabitants
  - 641 km2



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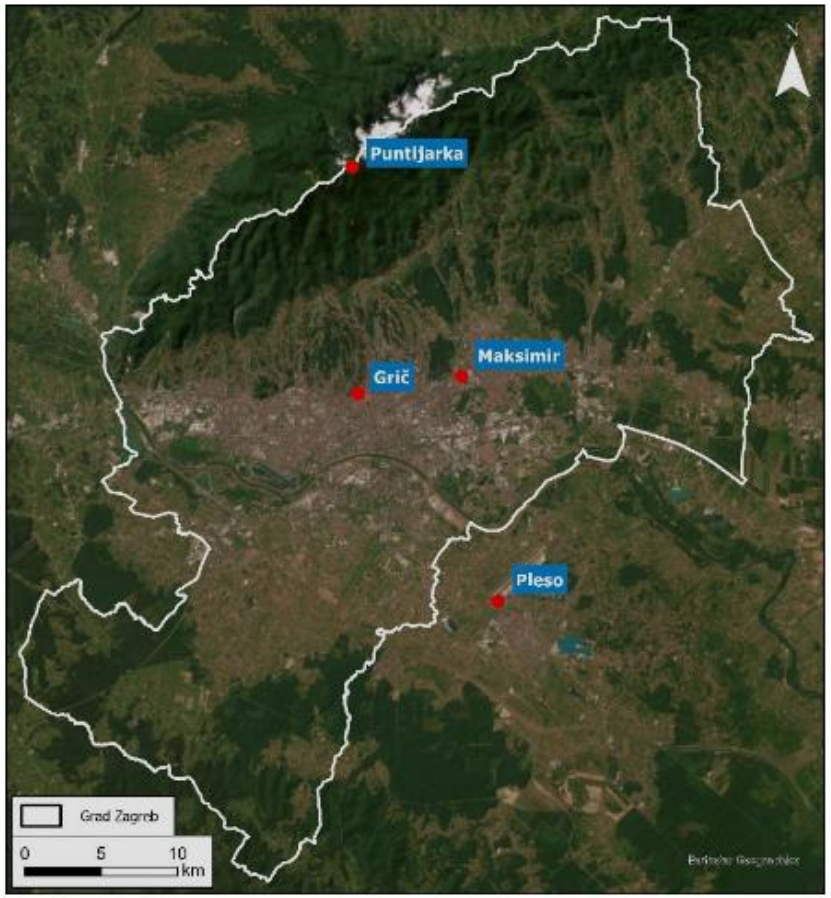
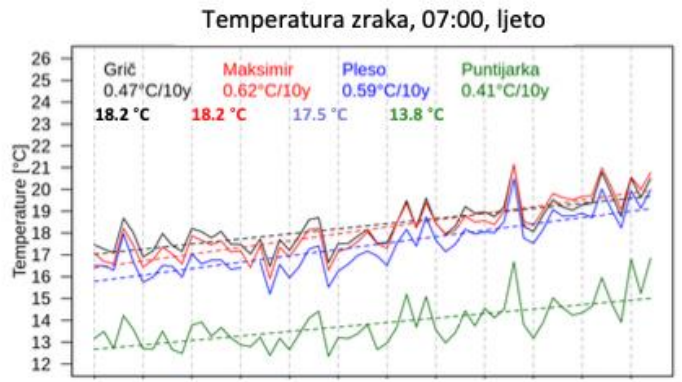
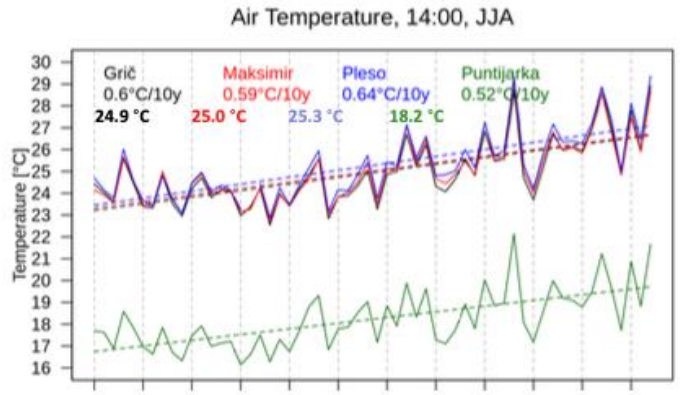
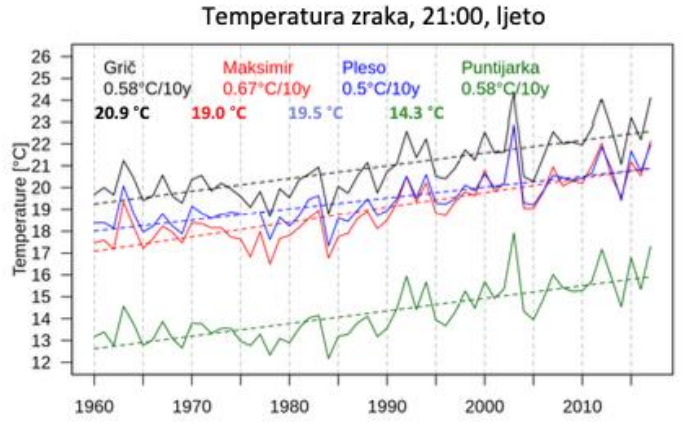
Climate change over the years









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The city is warming up!

- **All four main metorological weather stations are showing an increase of temperature and reclasification of climate classes**!

- Grič, Maksimir and Pleso weather stations – from moist moderate warm climate with warm summers (Cfb) to moist moderate climate with hot summers (Cfa) (due to increase of average daily temp in July above 22C)
- Puntijarka weather station – from moist snow-forrest climate (Dfb) to moderatly warm climate (Cfb) – due to inrease of monthly average temp of coldest month Januray, that no longer goes below -3C

- **What really happened**
  - The Mountain area now has the climate which the City used to have
  - City climate is now more simmilar to the climate of Croatia's mediterannean cities

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Steps needed to develop and implement adaptation strategies!

1. Preparing the ground for adaptation
2. Assessing climate change risks and vulnerabilities
3. Identifying adaptation options
4. Assessing and selecting adaptation options
5. Implementing adaptation
6. Monitoring and evaluating adaptation

Essentials – what can drive or stop the process

- Obtaining political support! (City councils on board!)
- Colleting initial information (analysis, historical data, other relevant strategic data…)
- Setting up the process
  - Governance model (who internally, who externally)
  - Resources (human, technical)
  - Funding – there will be need for expert support, data, analysis
- Stakeholders
  - Identification
  - Engagement
  - Reccomended to use the pentahelix approach (local governance, businesses and industry, academia, NGO sector, general public)
- Increase awareness (extremely important!)

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This excersise is very technical, but communication with stakeholders is crucial!

- You need to:
- Recognize past and present climate impacts (a lot of baseline data will be needed)!
- Understand the climate projections and future impacts
- Identify vulnerable sectors (not all of them are equally vulnerable, stakeholder communication is important)
- Conduct risk and vulnerability assessment (there is a guiding template on CoM web)
- Identify main adaptation concerns and defining objectives
- Assessing climate change risks and vulnerabilities

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Adaptation – baseline!

- Climate change Risk and Vulnerabilities Assessment (RVA)
- **Identifies the most relevant** climate hazards **and vulnerabilities affecting the city, region or lower level**
- **Adaptation measures planned accordingly**

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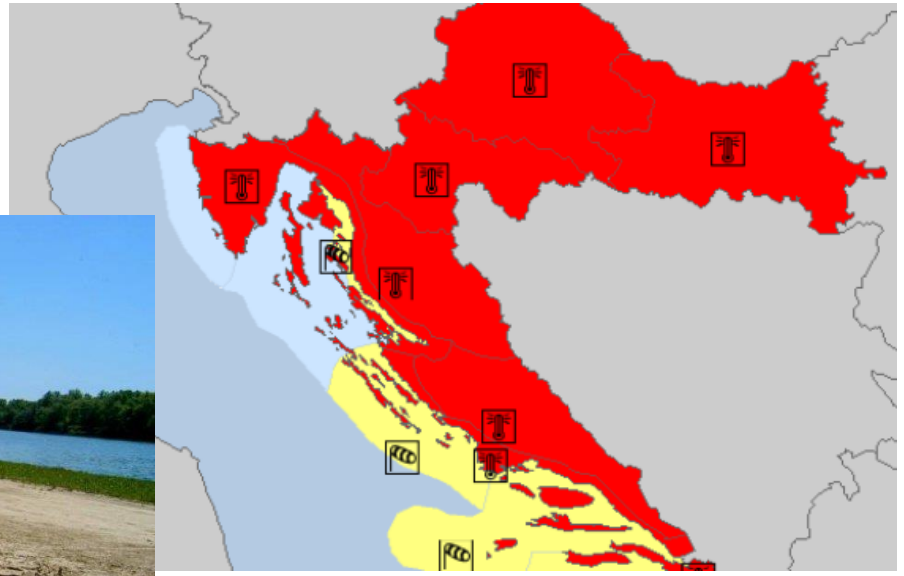
Adaptation – sectors

- Should include actions in sectors/areas which are most likely to be **vulnerable to climate change**
- **Typically:**
  - Buildings
  - Transport
  - Energy
  - Water
  - Waste
  - Land use planning
  - Environment and biodiversity
  - Agriculture and forestry
  - Health
  - Civil protection
  - Tourism



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Lessons learned!

- Baseline research and analysis are crucial, as well as expert support in risk modelling!
- **Extreme heat** – good assessment, yet to general
- **Extreme cold** – poor assesment
- **Urban floding** – some wrong assumptions
- **Adaptation measures planned** – in scope ok, in terms of urgency and size improvements are needed!

	Current risks	Anticipated risks		
Climate parameter	**Current risk level**	**Intensity change**	**Change in occurrence**	**Time period**
Extreme heat	High	Increase	Increase	Current risk
Extreme cold	**High**	**Increase**	**Increase**	Current risk
Urban flooding	**Low**	Increase	Increase	**Long term**
Drought	High	Increase	Increase	Current risk
Storms	High	Increase	Increase	Current risk
Land movement	High	Increase	Increase	Current risk
Fire of open space	Low	Increase	No change	Current risk

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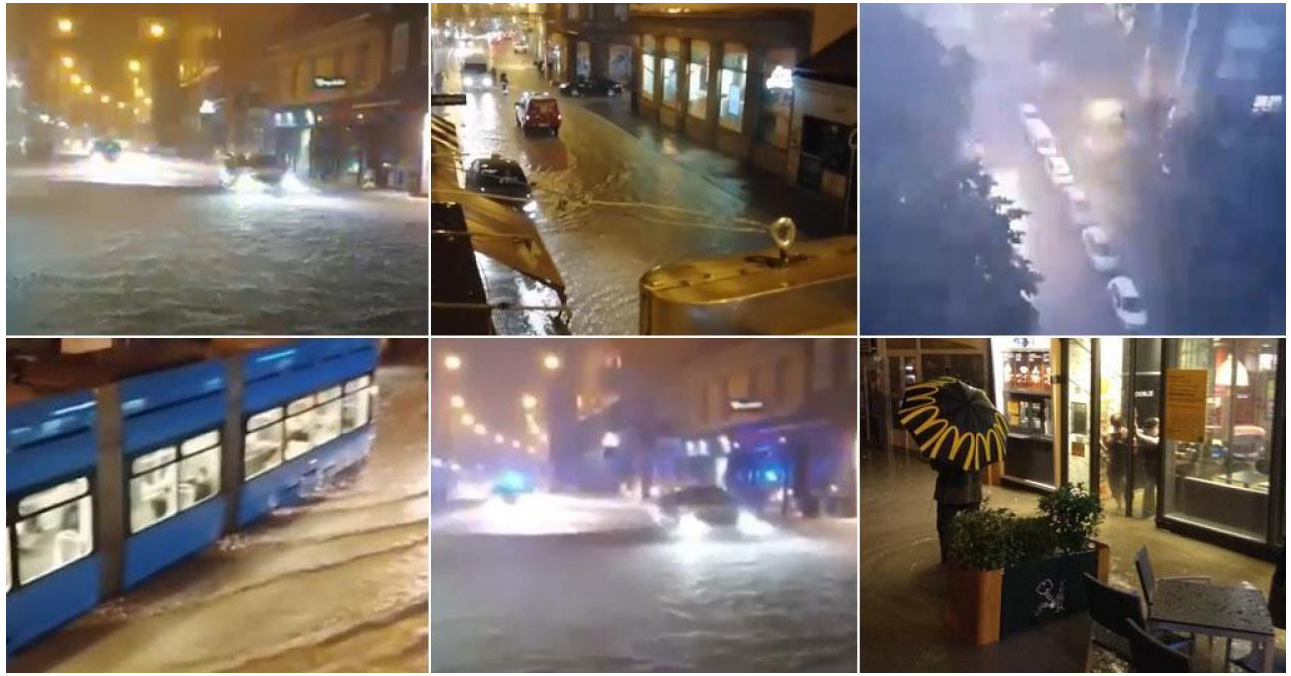
Urban flooding

July 2020, Zagreb



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Urban flooding

- **Reflection on risk assessment in 2018! Key facts:**
- **1. Drainage system capacity is insufficient.** Built in 18th and 19th century. Uncontrolled urbanization has put to much pressure on it! It is usually designed based on:
- a) Max expected rainfall in certain time period (changed)
- b) Frequency of occurrence (changed)
- c) Size of the urban area (growing)
- d) number of inhabitants (growing)
- e) obsolete piping in many parts of the City
- **2. Combined storm water and fecal drainage system**
- Same system absorbs rain water, fecal waters and waters from the Sljeme mountain in the vicinity of the City
- a) Systems neet to be separated
- b) Rain water from roofs directed to green surfaces or harvested (need to increase green surfaces area, green roofs, natural retentions…)

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Urban heat islands

Increase of medium heat impact related to urbanization and climate change (diff between 1961. – 1990. and 1991. – 2020.

Key facts:

1. Impact of heat is significant (average daily temperatures, increase of min and max temperatures, rise of heat indexes…)
2. Urban heat increase is a combination of global climate change and rate of urbanization
3. Buildings inhabited by vulnerable groups are concentrated in densly built areas of the city, thus more exposed to the heat
4. Urban heat island is present on the level of the city, but some areas are more critical

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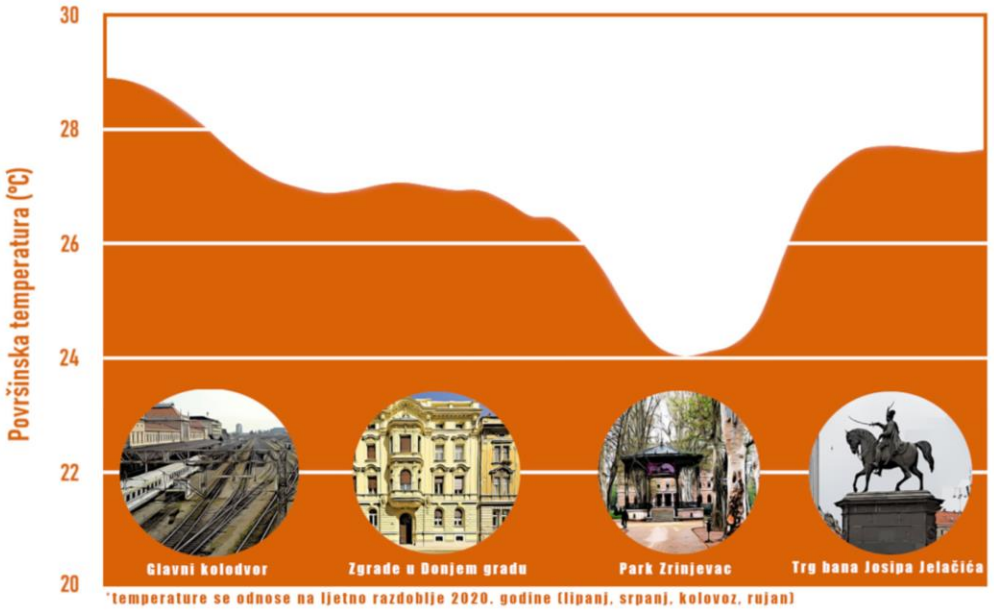
Urban heat islands

Urban heat assessment!

- Assessment was far to general – more detailed assessment needs to be performed!
- Detailed heat pressure analysis was performed!



- Heat pressure is not equaly distributed
- Temperature parameter is mostly dependant on atmosferic/climate influence but local conditions can modify them
- Synergistic effect of those parameters can cause amplification, for example heat vawes
- Heat pressure in the City is extreme

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Key elements

- Based on solid data, analysis and expert support
- RVA assessment is a crucial tool
- Some measures can be city wide in planning and execution
- Other measures are more place based – focus on narrow scope
- Stakeholders engagement is very important!
- Clear identification of roles and responsibilities, ownership is absolutely crucial
- (co)funding options have to be (even broadly) identified
- Monitoring needs to be envisaged and setup!

Title of the measure
Responsible for execution
Partners in execution
Other involved parties
Timeframe
Cost assessment
Funding options
Summary
Monitoring

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Key learnings

- Political support
- Motivated and expert staff
- Inter-departments cooperation
- Key stakeholders engaged and ownership identified
- Urban and spatial plans as enabling factors
- Abailability of funding, co-funding, budgeting
- Monitor, re-evaluate as you go, change if needed and implement

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Thank you !

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