CENTRAL EUROPE
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EUROPEAN UNION
EUROPEAN REGIONAL DEVELOPMENT FUND

UHI

Development and application of mitigation and adaptation strategies and measures for counteracting the global Urban Heat Islands phenomenon

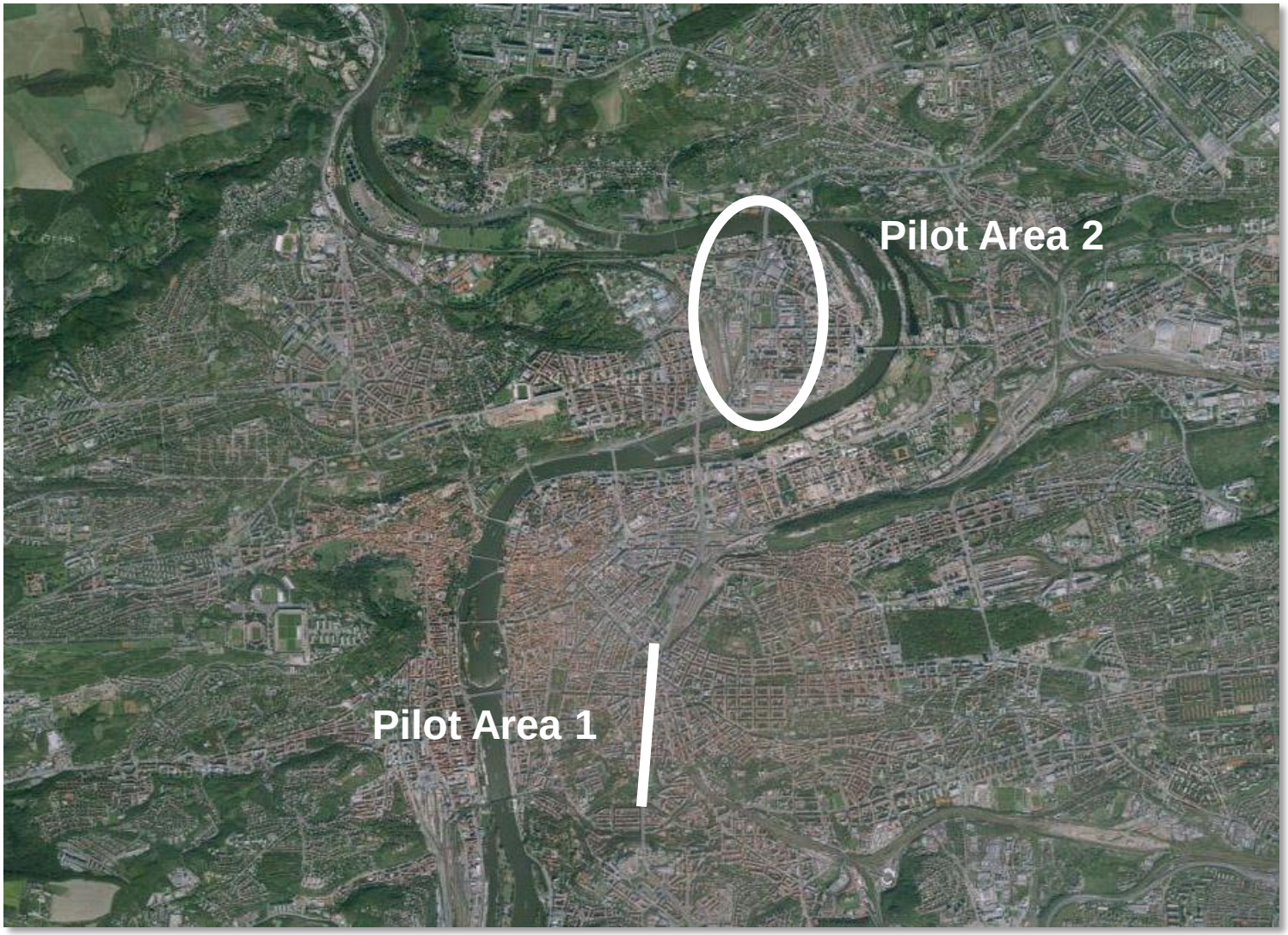
THE UHI PILOT ACTIONS IN PRAGUE

LWG meeting II on June 23th 2014

PP15 – Institut plánování a rozvoje hlavního města Prahy

Maria Kazmukova, Dominik Ales, Jan Flegl, Ondrej Zemanek

Projekt je spolufinancován programem CENTRAL EUROPE ERDF.


Pilot Area 2
Pilot Area 1

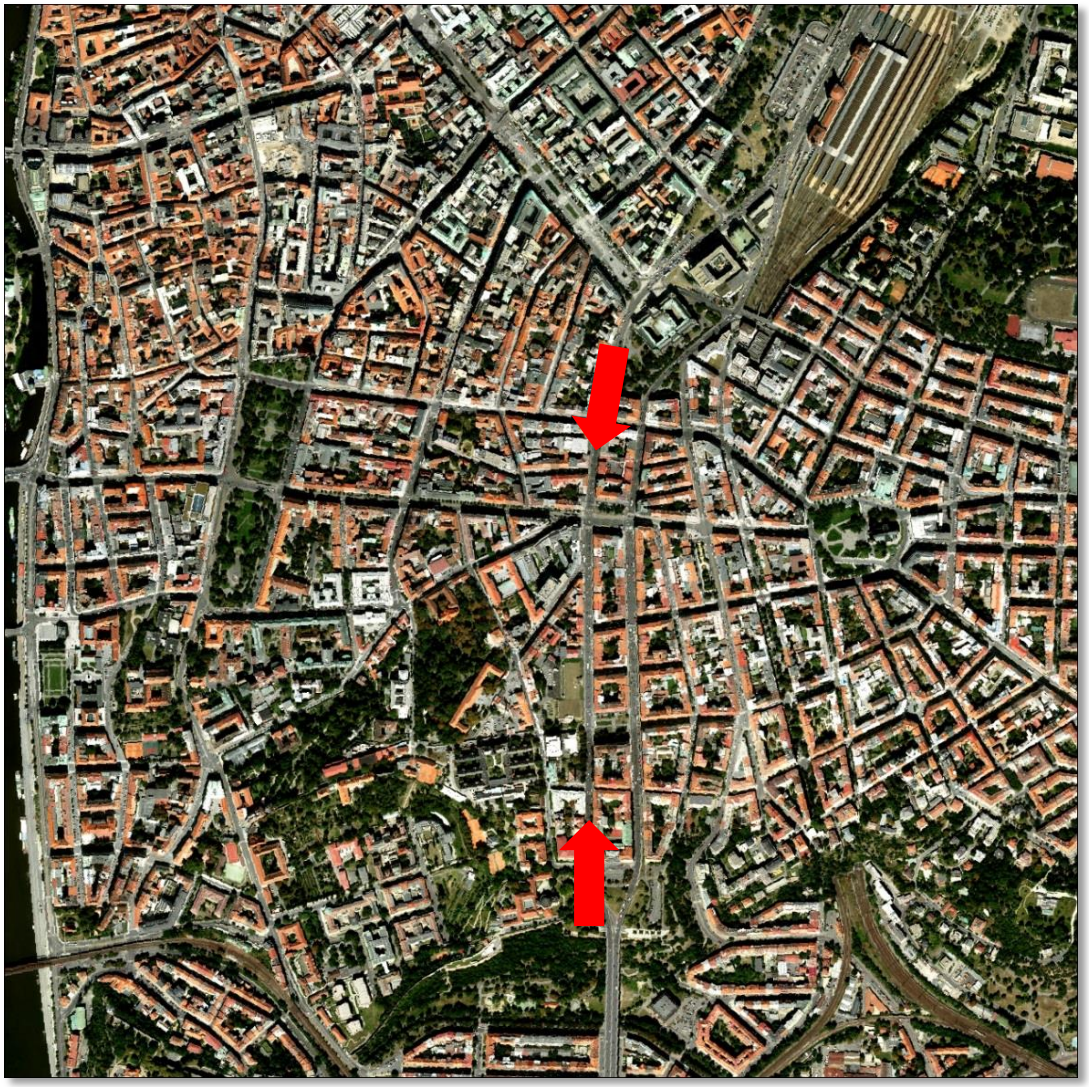
Pilot Area 1 – Legerova Street

In cooperation with

Charles University of Prague Department of Meteorology and Environment

and

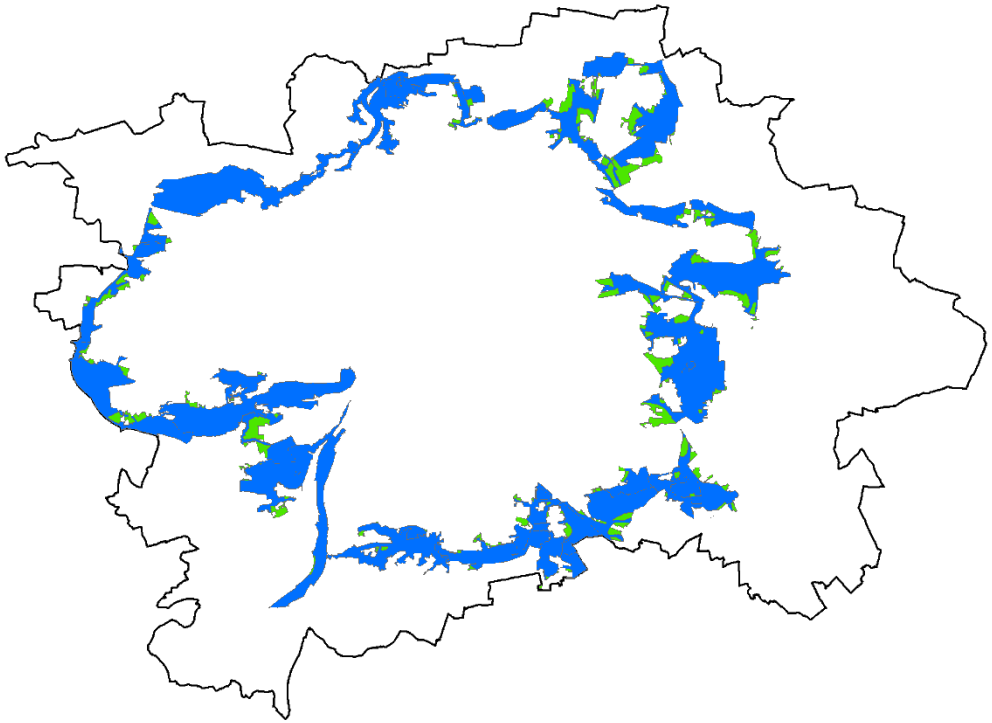
Czech Hydro – Meteorological Institute



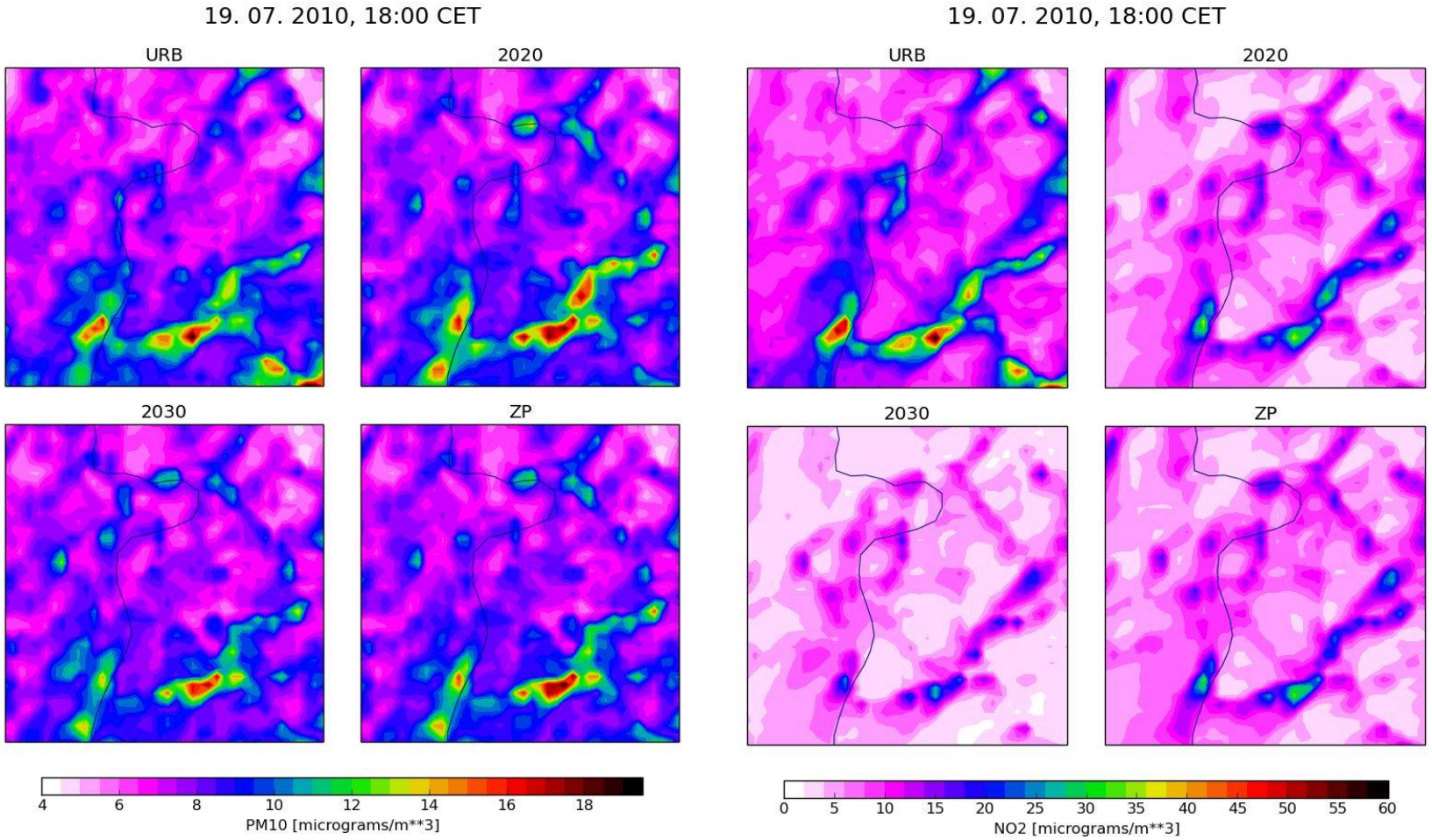
Pilot Area 2
Holešovice – Bubny

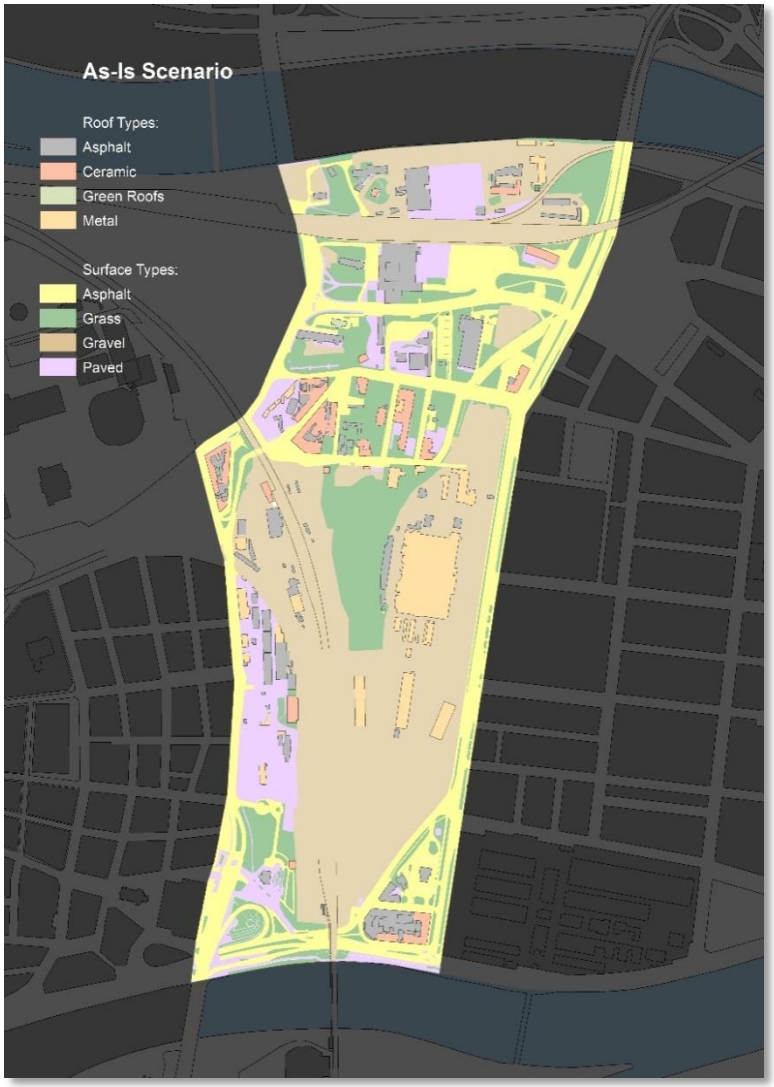
Pilot Area 3 – Green Boundary of Prague

In cooperation with **Charles University, Dept. of Meteorology**
ATEM – Atelier of Ecological Modelling
Czech Technical University



Pilot Area 3 – Green Boundary of Prague

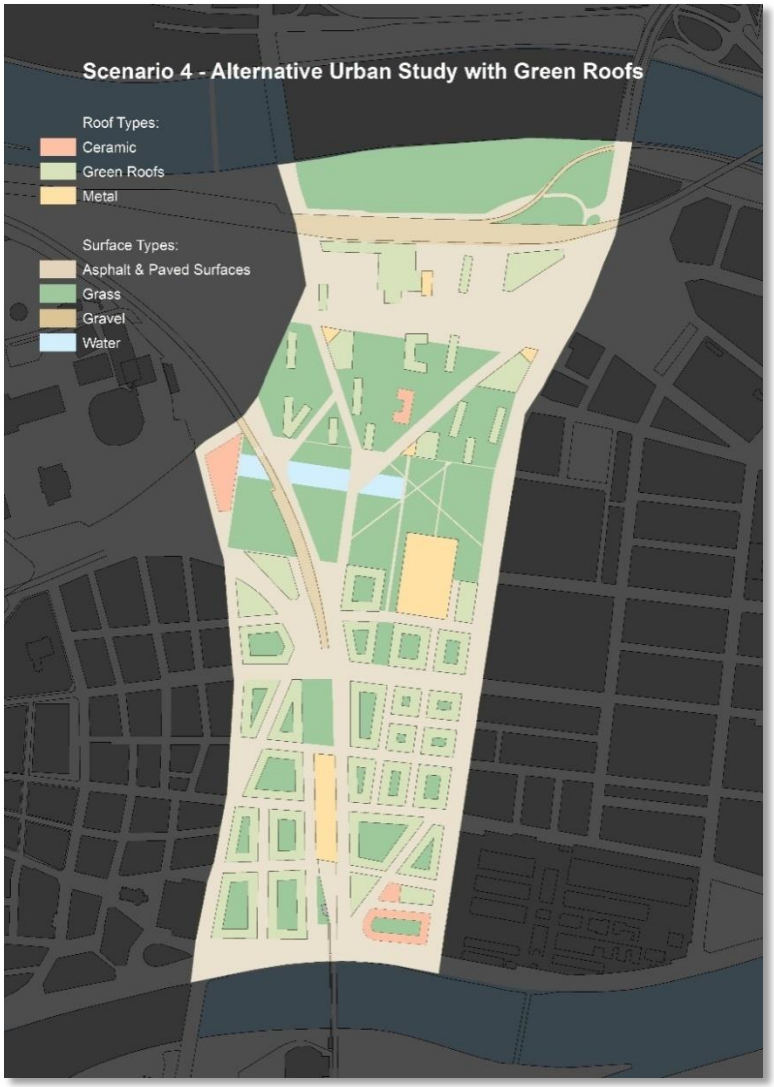



As-Is Scenario
Roof Types:
Asphalt
Ceramic
Green Roofs
Metal
Surface Types:
Asphalt
Grass
Gravel
Paved


Scenario 1 - Urban Study
Tree Types:
Avenues
Courtyards
Parks
Roof Types:
Asphalt
Metal
Ceramic
Surface Types:
Asphalt & Paved Surfaces
Grass
Gravel


Scenario 2 - Urban Study with Green Roofs
Roof Types:
Asphalt
Ceramic
Green Roofs
Metal
Surface Types:
Asphalt & Paved Surfaces
Grass
Gravel


Scenario 3 - Alternative Urban Study
Tree Types:
Avenues
Courtyards
Parks
Roof Types:
Asphalt
Ceramic
Metal
Surface Types:
Asphalt
Grass
Gravel
Water


Scenario 4 - Alternative Urban Study with Green Roofs
Roof Types:
Ceramic
Green Roofs
Metal
Surface Types:
Asphalt & Paved Surfaces
Grass
Gravel
Water


Scenario 5 - Alternative Urban Study
Tree Types:
Avenues
Courtyards
Parks
Roof Types:
Asphalt
Ceramic
Metal
Surface Types:
Asphalt
Grass
Gravel
Water


Scenario 6 - Alternative Urban Study with Green Roofs
Roof Types:
Ceramic
Green Roofs
Metal
Surface Types:
Asphalt & Paved Surfaces
Grass
Gravel
Water

Testing area for ENVImet simulations

ENVImet simulations for June 20th at 3.00 PM

Temperature differences between scenarios 3 and 1:

the treets are cooler than the central park area

Section view:

- below -0.15 °C
- -0.15 to -0.05 °C
- -0.05 to 0.05 °C
- 0.05 to 0.15 °C
- 0.15 to 0.25 °C
- 0.25 to 0.35 °C
- 0.35 to 0.45 °C
- above 0.45 °C

Min: -0.25 °C
Max: 16.82 °C

Plan view:

- below -0.70 °C
- -0.70 to -0.50 °C
- -0.50 to -0.30 °C
- -0.30 to -0.10 °C
- -0.10 to 0.10 °C
- 0.10 to 0.30 °C
- 0.30 to 0.50 °C
- 0.50 to 0.70 °C
- above 0.70 °C

Min: -1.58 °C
Max: 17.27 °C

Scenario 1

Set of small scale parks

Scenario 3

Central park orientated E – W

ENVImet simulations for June 20th at 3.00 PM

Temperature differences between scenarios 5 and 1:

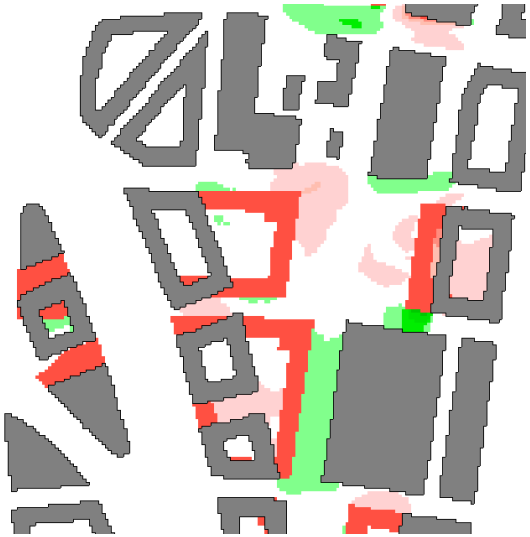
the streets are cooler than the central park area

Scenario 1

Set of small scale parks

Scenario 5

Central park orientated S – N



Plan view:

- below -0.70 °C
- -0.70 to -0.50 °C
- -0.50 to -0.30 °C
- -0.30 to -0.10 °C
- -0.10 to 0.10 °C
- 0.10 to 0.30 °C
- 0.30 to 0.50 °C
- 0.50 to 0.70 °C
- above 0.70 °C

Min: -0.80 °C
Max: 16.27 °C

ENVImet simulations for June 20th at 3.00 PM

Relative humidity differences between scenarios 3 and 1:

the central park area is less humid than the streets

Section view:

- below -0.30 %
- -0.30 to -0.10 %
- -0.10 to 0.10 %
- 0.10 to 0.30 %
- 0.30 to 0.50 %
- 0.50 to 0.70 %
- 0.70 to 0.90 %
- above 0.90 %

Min: -56.89 %
Max: 1.29 %

Plan view:

- below -3.50 %
- -3.50 to -2.50 %
- -2.50 to -1.50 %
- -1.50 to -0.50 %
- -0.50 to 0.50 %
- 0.50 to 1.50 %
- 1.50 to 2.50 %
- 2.50 to 3.50 %
- above 3.50 %

Min: -57.98 %
Max: 4.90 %

Evaluation i progress…

Scenario 1

Set of small scale parks

Scenario 3

Central park orientated E – W

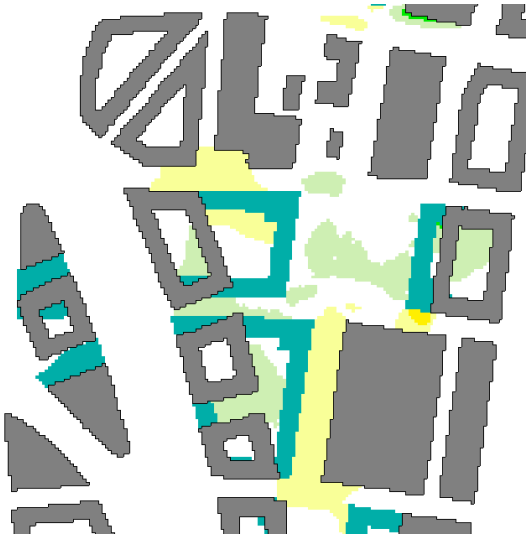
ENVImet simulations for June 20th at 3.00 PM

Relative humidity differences between scenarios 5 and 1:

Plan view:

- below -3.50 %
- -3.50 to -2.50 %
- -2.50 to -1.50 %
- -1.50 to -0.50 %
- -0.50 to 0.50 %
- 0.50 to 1.50 %
- 1.50 to 2.50 %
- 2.50 to 3.50 %
- above 3.50 %

Min: -55.39 %
Max: 2.33 %



Evaluaton in progress…

Scenario 1
Set of small scale parks

Scenario 5
Central park orientated S – N

ENVImet simulations for June 20th at 3.00 PM

Temperature differences between scenarios 6 and 5:

almost no effect of the green roofs

Section view:

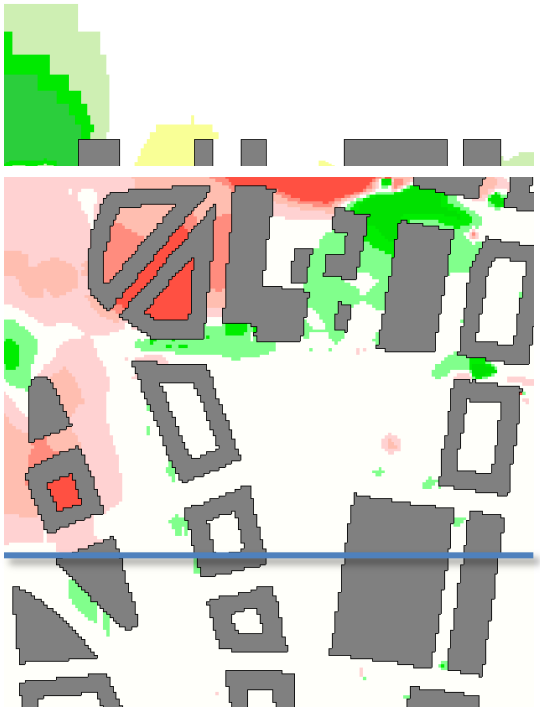
- below -0.005 °C
- -0.005 to -0.003 °C
- -0.003 to -0.001 °C
- -0.001 to 0.001 °C
- above 0.001 °C

Min: -0.011 °C
Max: 0.003 °C

Plan view:

- below -0.035 °C
- -0.035 to -0.025 °C
- -0.025 to -0.015 °C
- -0.015 to -0.005 °C
- -0.005 to 0.005 °C
- 0.005 to 0.015 °C
- 0.015 to 0.025 °C
- above 0.025 °C

Min: -16.238 °C
Max: 0.141 °C



Scenario 6

Alternative urban study
with green roofs

Scenario 5

Alternative urban study

Temperature differences between Scenario 1 and As-Is Scenario: **decrease in the central part due to the park**

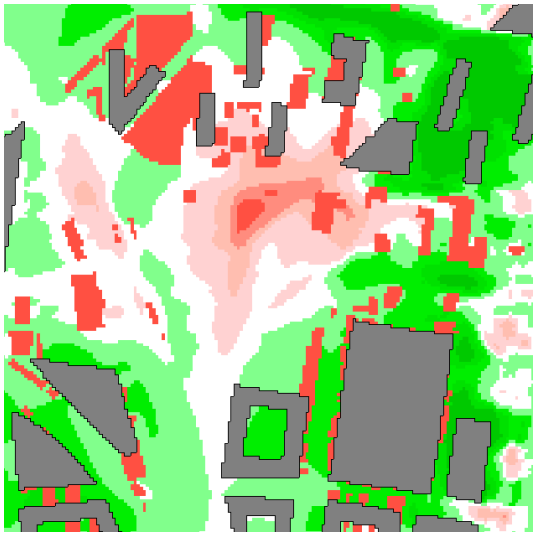
- below -0.70 °C
- -0.70 to -0.50 °C
- -0.50 to -0.30 °C
- -0.30 to -0.10 °C
- -0.10 to 0.10 °C
- 0.10 to 0.30 °C
- 0.30 to 0.50 °C
- 0.50 to 0.70 °C
- above 0.70 °C

Min: -2.05 °C
Max: 16.60 °C

Differences between Scenario 3 and As-Is Scenario: **increase in the central part due to the busy road?**

- below -0.70 °C
- -0.70 to -0.50 °C
- -0.50 to -0.30 °C
- -0.30 to -0.10 °C
- -0.10 to 0.10 °C
- 0.10 to 0.30 °C
- 0.30 to 0.50 °C
- 0.50 to 0.70 °C
- above 0.70 °C

Min: -1.63 °C
Max: 16.81 °C



Humidity differences between Scenario 1 and As-Is Scenario: **increase in the central part due to the park**

- below -3.50 %
- -3.50 to -2.50 %
- -2.50 to -1.50 %
- -1.50 to -0.50 %
- -0.50 to 0.50 %
- 0.50 to 1.50 %
- 1.50 to 2.50 %
- 2.50 to 3.50 %
- above 3.50 %

Min: -56.74 %
Max: 6.82 %

Differences between Scenario 3 and As-Is Scenario: **decrease in the central part due to the busy road?**

- below -3.50 %
- -3.50 to -2.50 %
- -2.50 to -1.50 %
- -1.50 to -0.50 %
- -0.50 to 0.50 %
- 0.50 to 1.50 %
- 1.50 to 2.50 %
- 2.50 to 3.50 %
- above 3.50 %

Min: -56.75 %
Max: 5.17 %

Evaluation in progress…

Flat roof of IPR Praha

Green roof of a bank building in Prague – Radlice