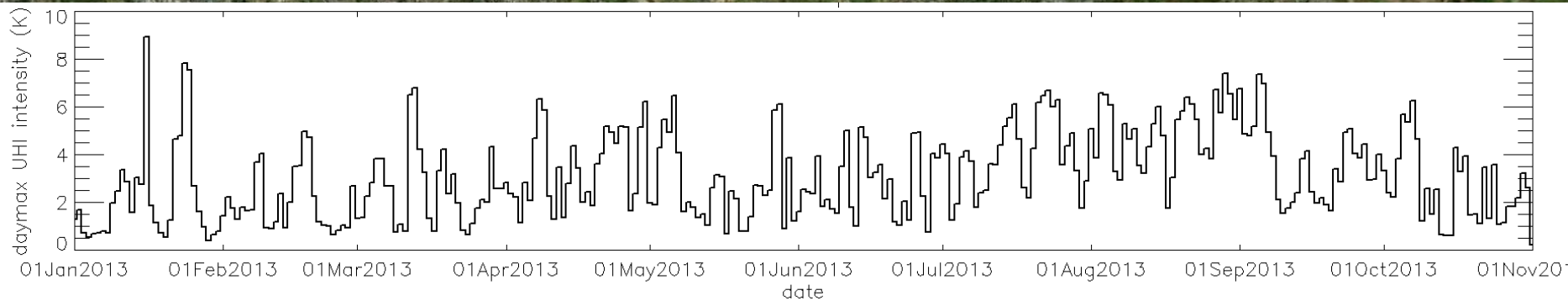




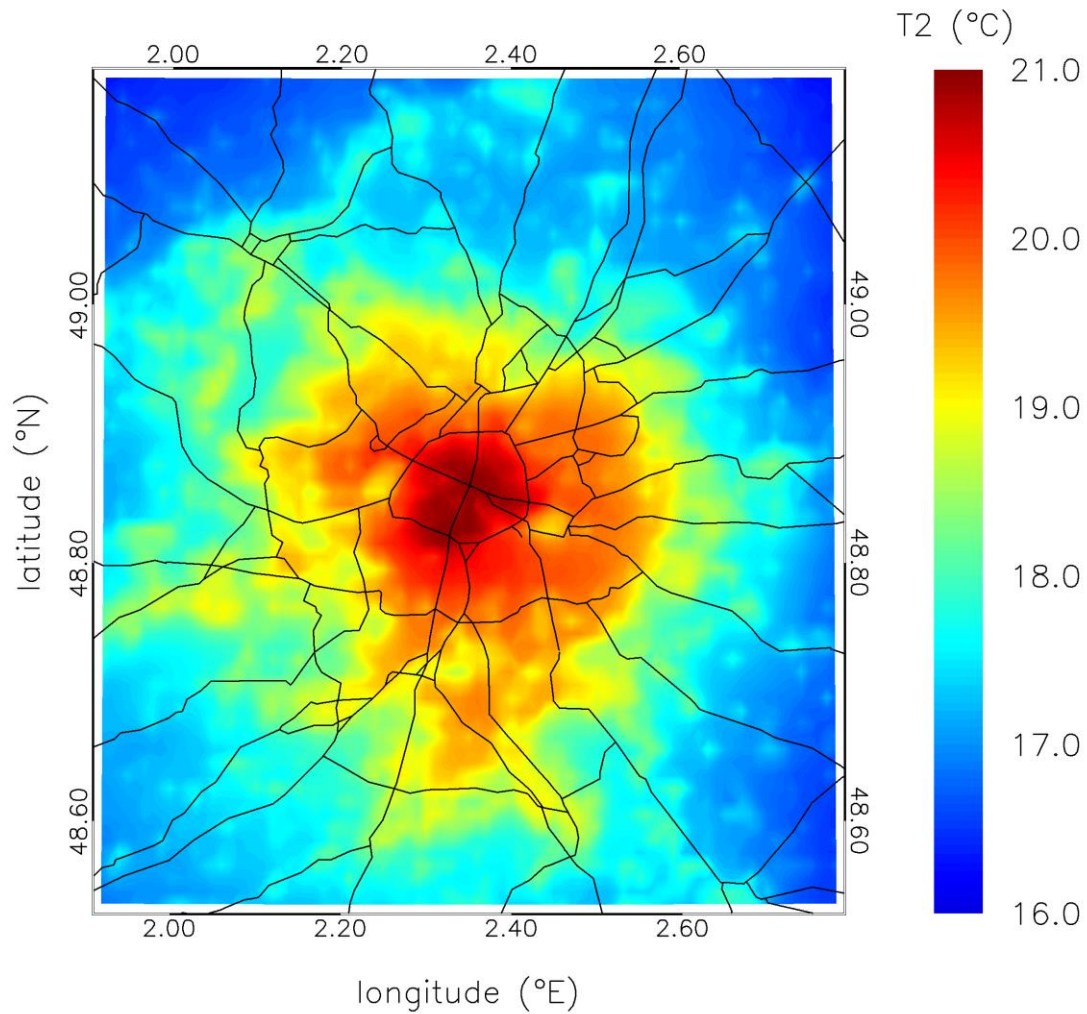
PUCS has received funding
from the European Union's Horizon 2020
Research and Innovation Programme
under Grant Agreement No. 730004

ÎLOTS DE CHALEUR URBAINS

Koen De Ridder



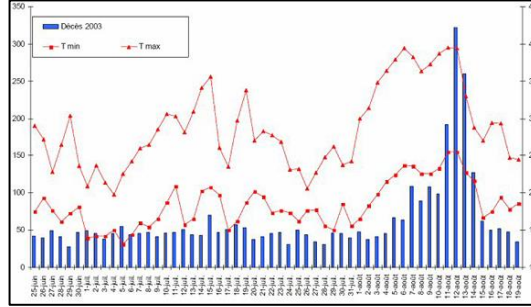
PARIS, 22:00 UT, JUL-AUG 2003



De Ridder et al. (2016)

IMPACTS

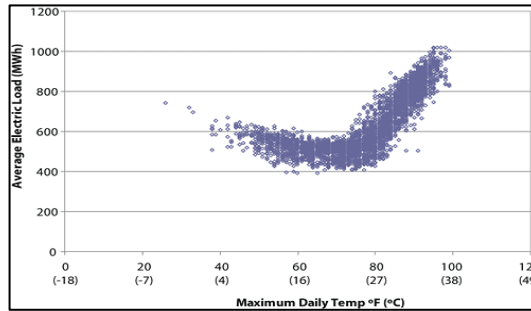
health



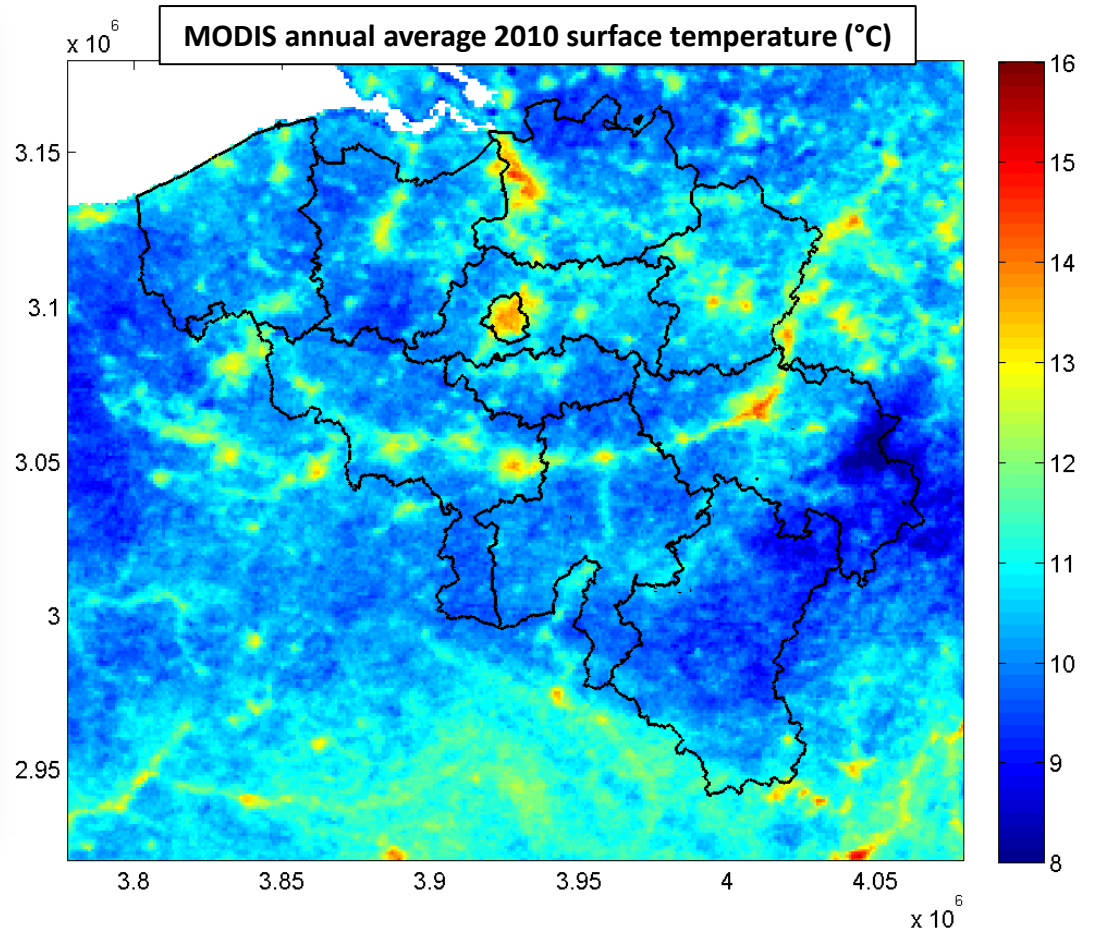
infrastructure



energy



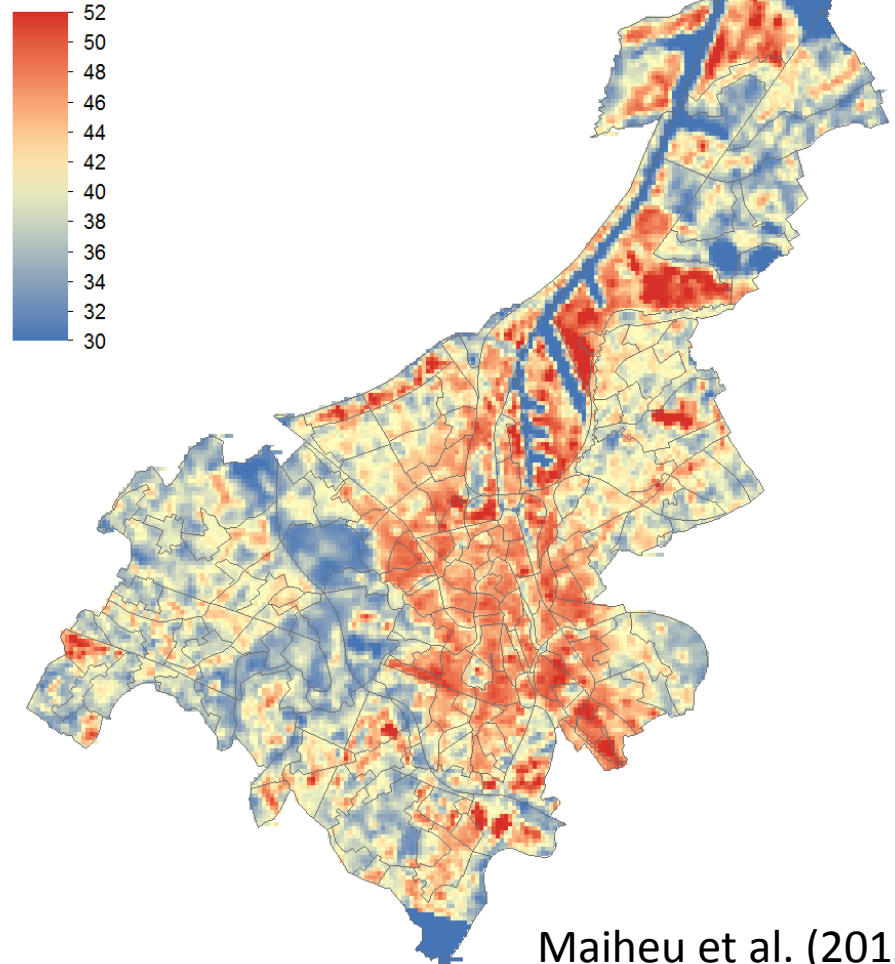
SATELLITE SURFACE TEMPERATURE



De Ridder et al. (2015)

SATELLITE SURFACE TEMPERATURE

Oppervlakte temperatuur [°C]
ASTER - 90m
Gent - 2006-06-13, 13:03 LT



Verspreiding: Beperkt  

Eindrapport
Opmaak van een hittekaart en analyse van het stedelijk hitte-eiland effect voor Gent

Bino Maiheu, Karel Van den Berghe, Luuk Boelens, Koen De Ridder en Dirk Lauwaet

Studie uitgevoerd in opdracht van: Stad Gent - Milieudienst
 2013/RMA/R/113
 Juni 2013










Milieu
 Ruimtelijk & Juridische Planning
 Coördinator dienst

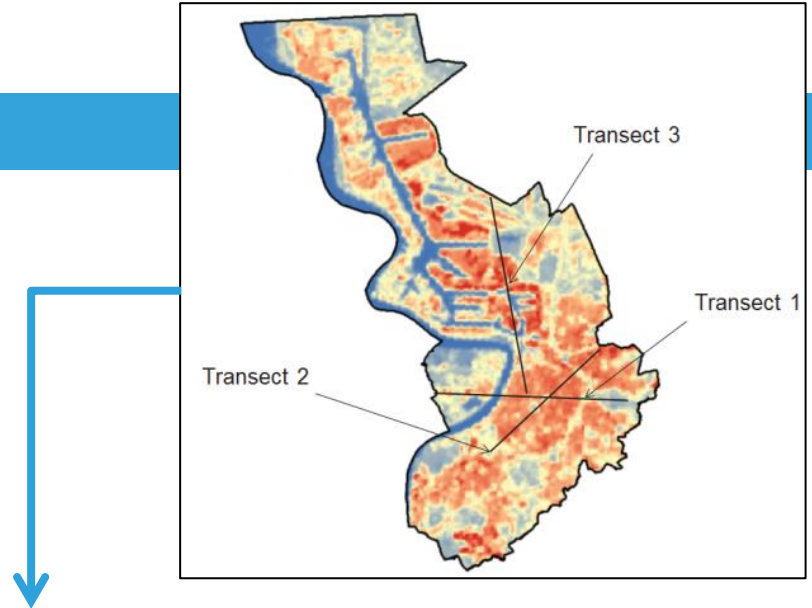
VITO NV
 Boerentang 200 - 2400 MOL - BELGIË
 Tld. + 32 14 33 55 11 - Fax + 32 14 33 55 99
 vito@vito.be - www.vito.be

BTW BE-0244.135.916 BPR (Turnhout)
 Bank: 375-1117254-90 ING
 BE34 3751 1173 5490 - BBRUBEBB

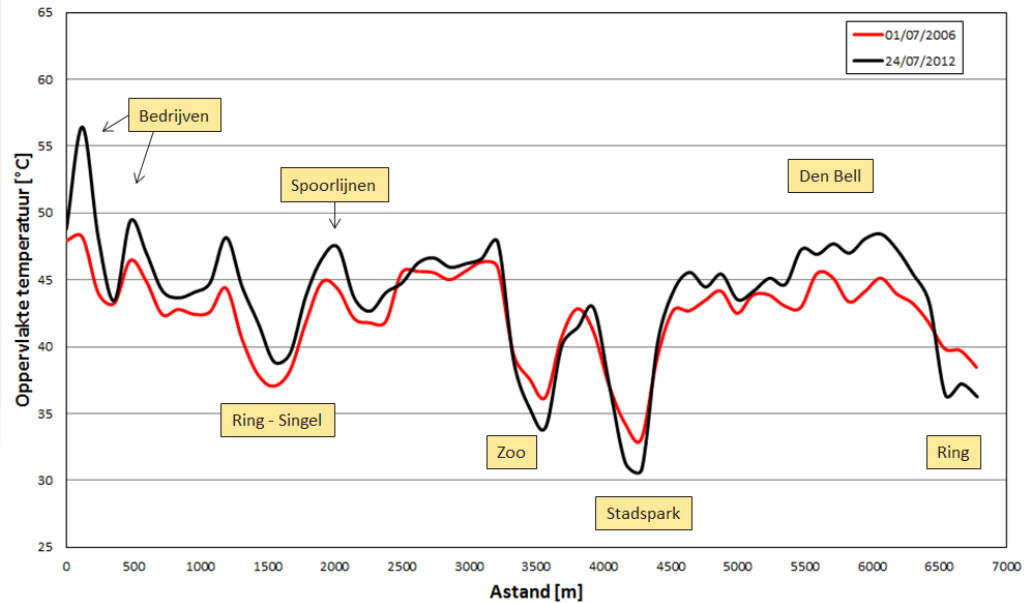
RMA/N78H7/2012-0003

Maiheu et al. (2013)

SATELLITE SURFACE TEMPERATURE



Transect 2: Albertkanaal - Ring (zuid)



Lauwaet et al. (2013)

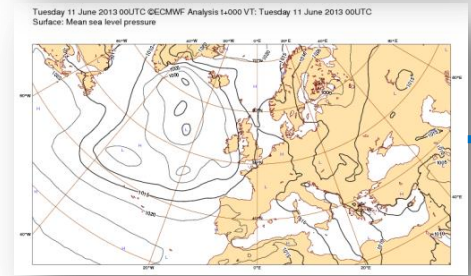
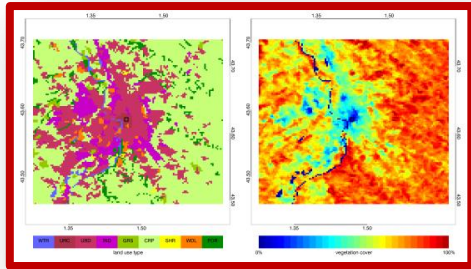
LIMITATIONS DES DONNEES SATELLITAIRES

- Résolution spatiale \leftrightarrow temporelle
- Fournit uniquement la température de surface (pas la température de l'air, ni l'humidité, vitesse du vent, ...)
- Pas de scénarios, pas de projections futures



VITO'S *URBCLIM* MODEL

terrain



large-scale observed meteorology or climate projection (IPCC)

Input

$$\frac{\partial u}{\partial t} + u \frac{\partial u}{\partial x} + v \frac{\partial u}{\partial y} + w \frac{\partial u}{\partial z} = -\frac{1}{\rho_0} \frac{\partial P}{\partial x} + fv - \frac{\partial}{\partial z} (\overline{u'w'})$$

$$\frac{\partial v}{\partial t} + u \frac{\partial v}{\partial x} + v \frac{\partial v}{\partial y} + w \frac{\partial v}{\partial z} = -\frac{1}{\rho_0} \frac{\partial P}{\partial y} - fu - \frac{\partial}{\partial z} (\overline{v'w'})$$

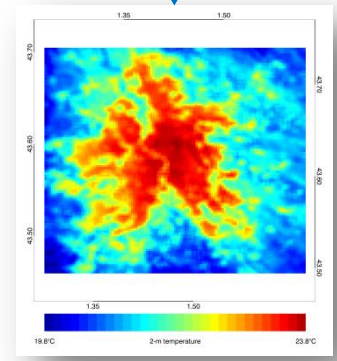
$$\frac{\partial \theta}{\partial t} + u \frac{\partial \theta}{\partial x} + v \frac{\partial \theta}{\partial y} + w \frac{\partial \theta}{\partial z} = -\frac{\partial}{\partial z} (\overline{w'\theta'})$$

$$\frac{\partial q}{\partial t} + u \frac{\partial q}{\partial x} + v \frac{\partial q}{\partial y} + w \frac{\partial q}{\partial z} = -\frac{\partial}{\partial z} (\overline{w'q'})$$

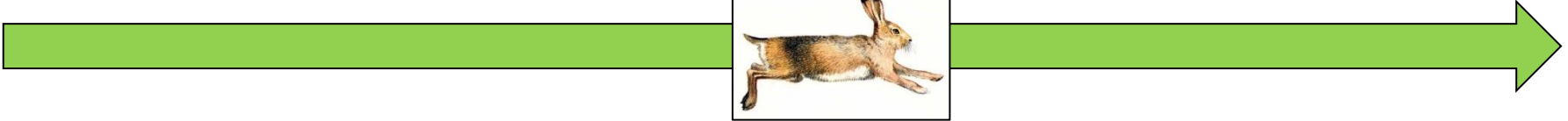
$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0$$

UrbClim

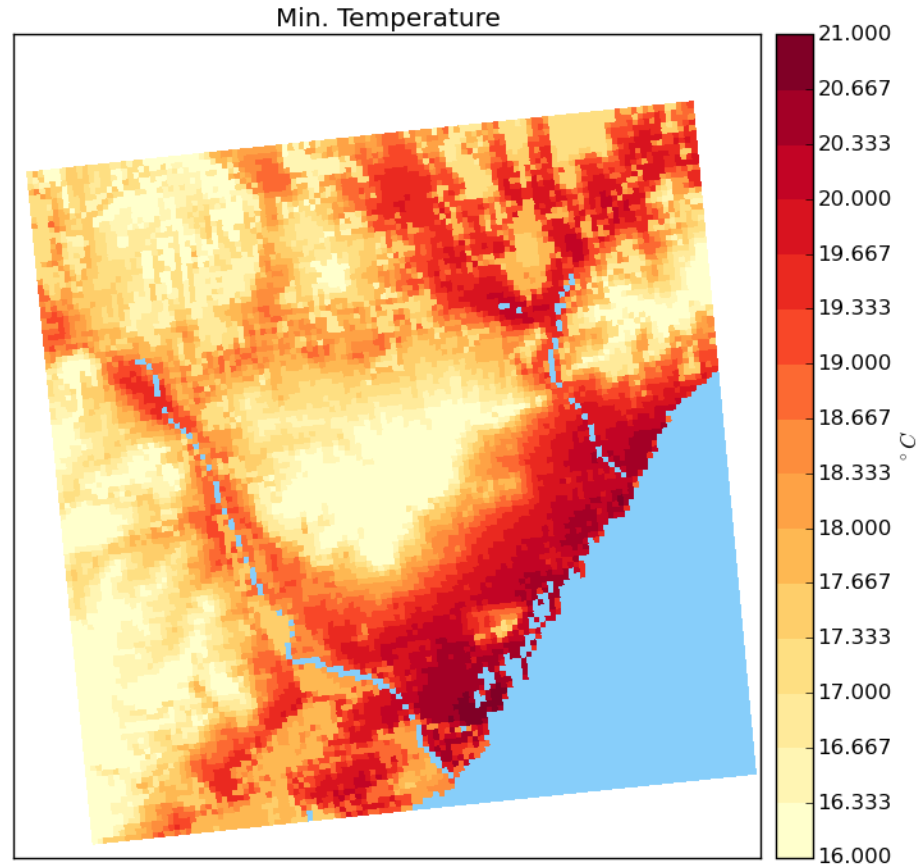
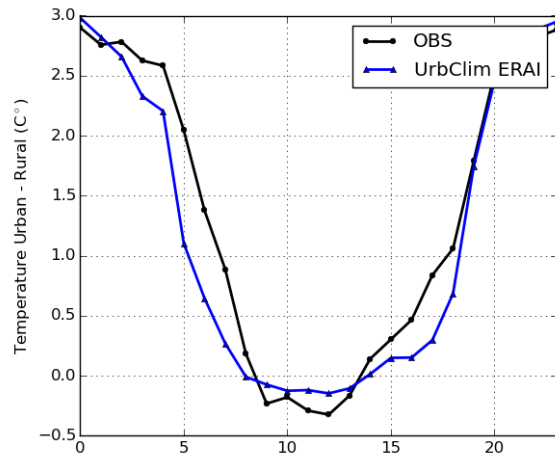
- hourly gridded (250-m)
- temperature
 - humidity
 - wind speed



UHI maps
Output

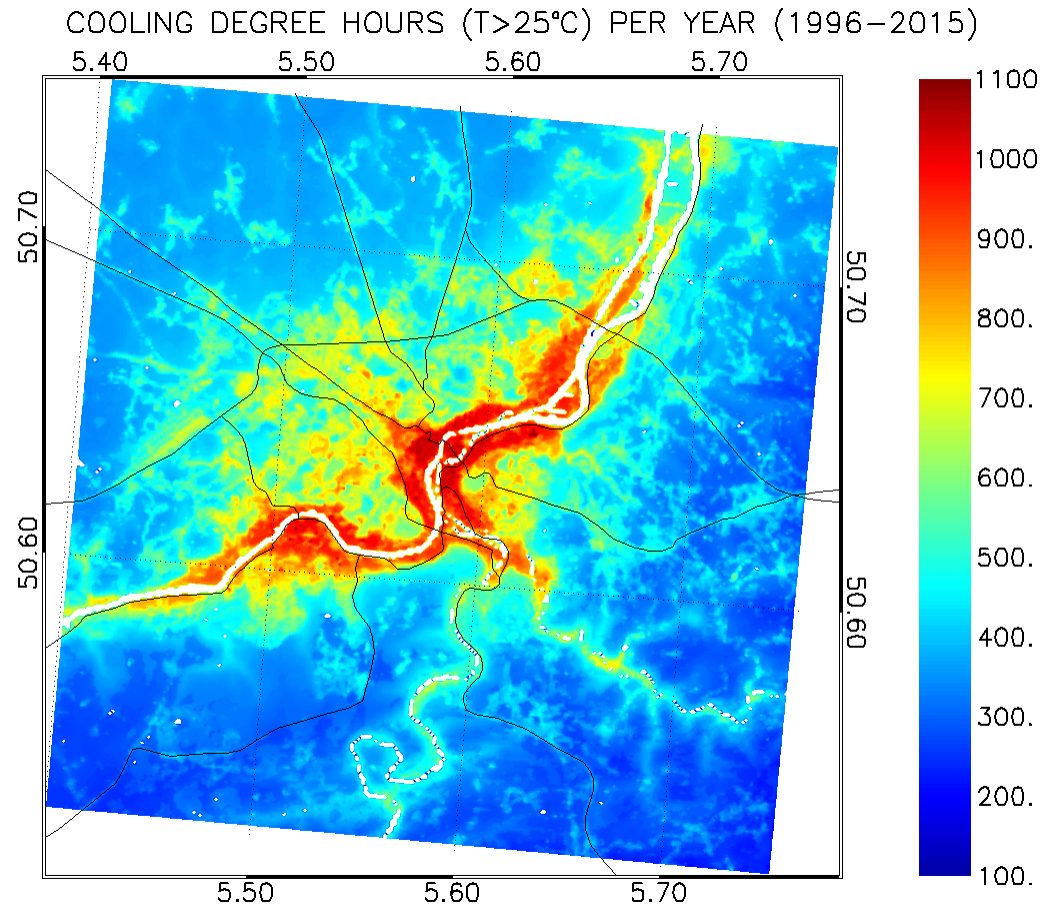


VALIDATION



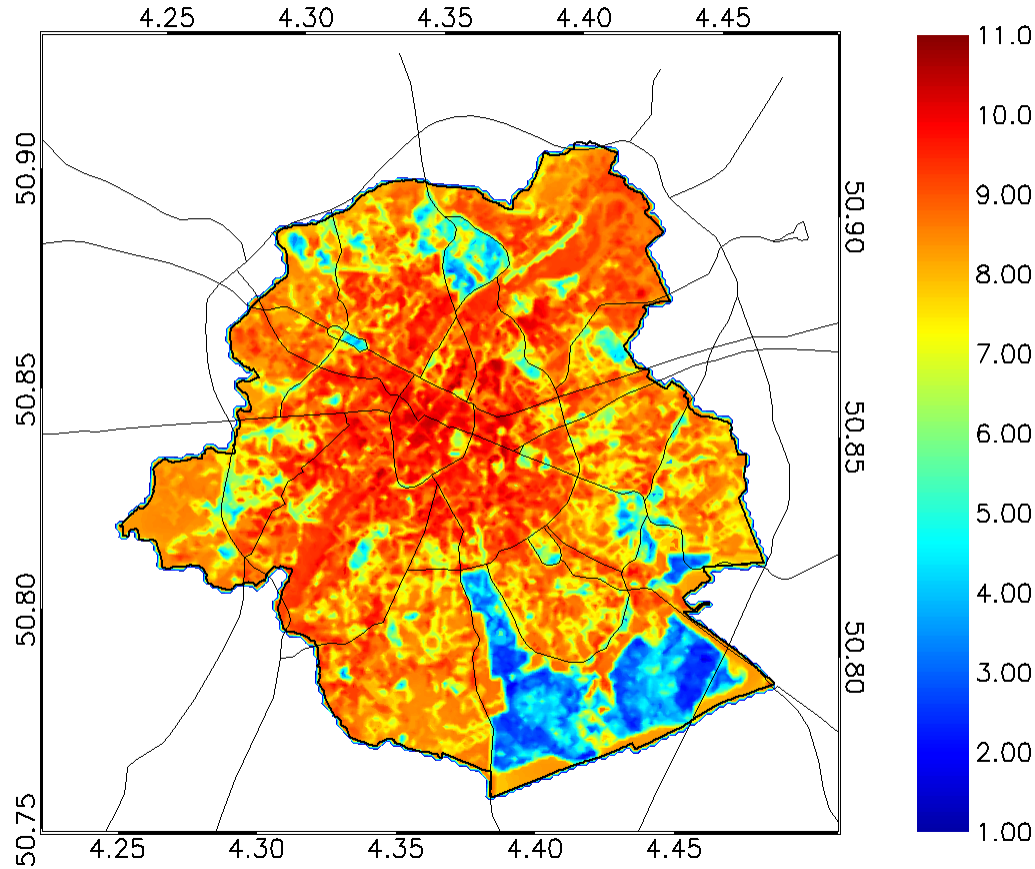
García-Diez et al. (2016)

LIEGE – COOLING DEGREE HOURS PER YEAR

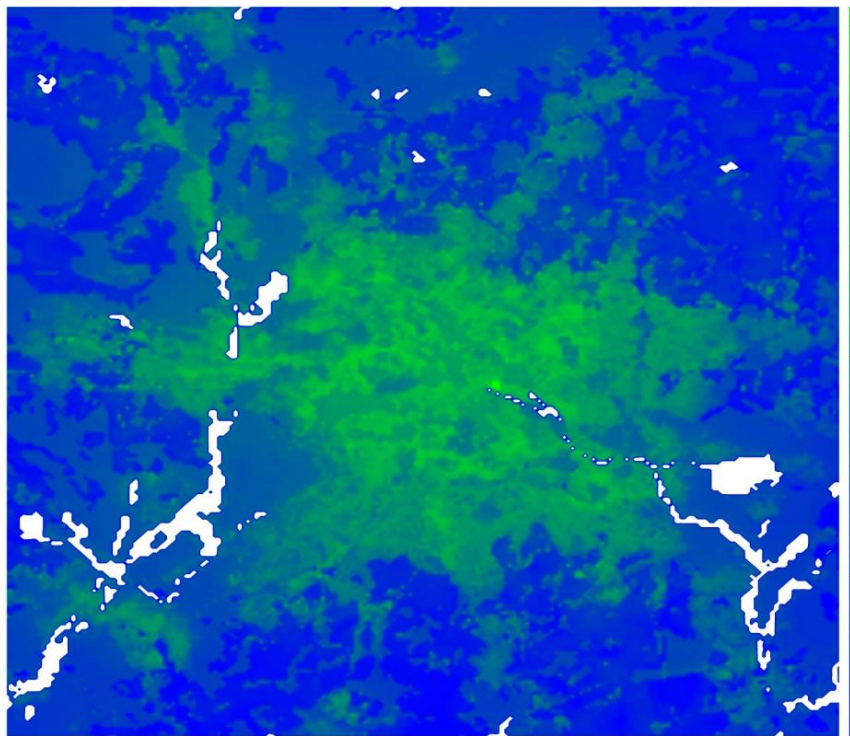


BRUSSELS – LOST WORKING HOURS

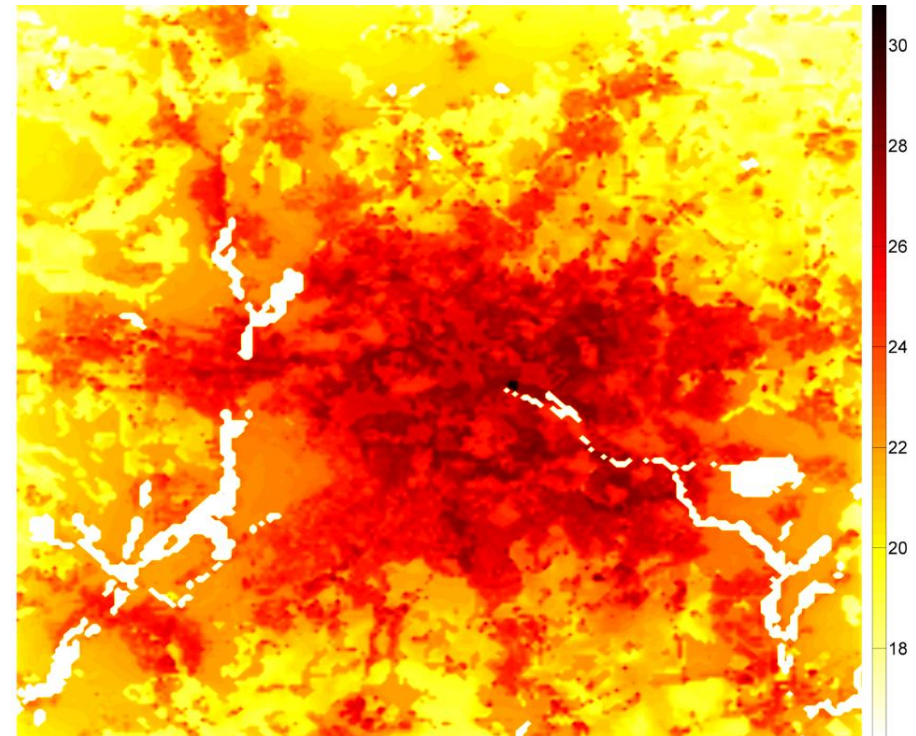
POTENTIALLY LOST WORKING HOURS – HEAVY WORK JJA 2003 [%]



URBAN CLIMATE PROJECTIONS



1986-2005

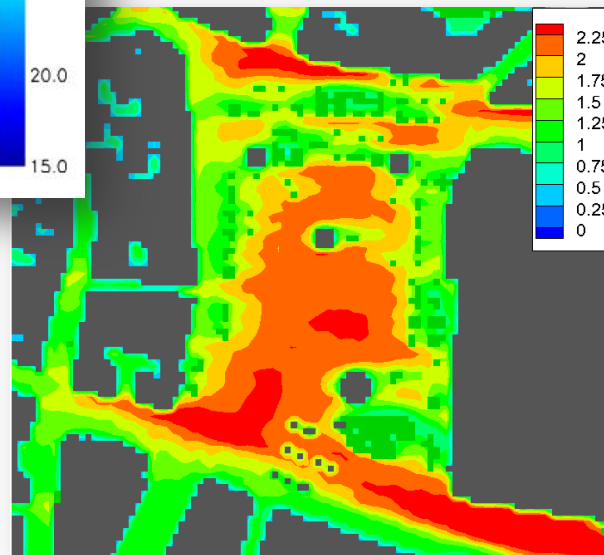
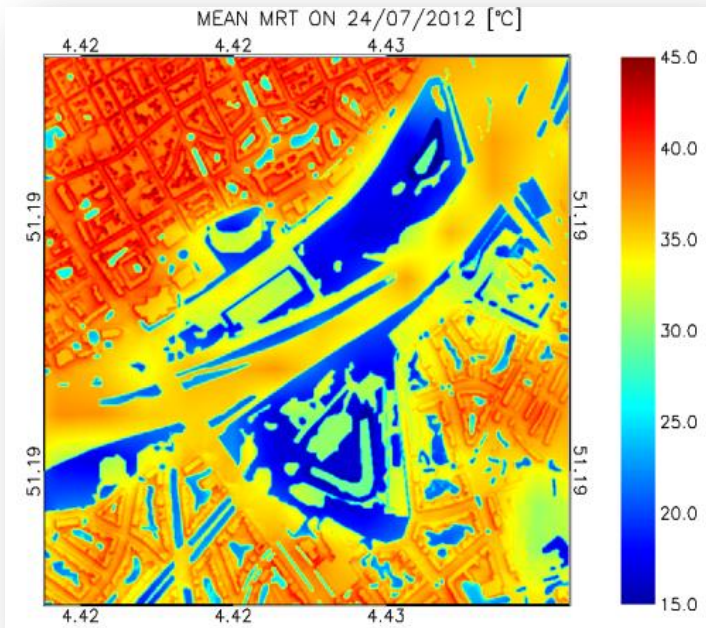


2081-2100 (RCP8.5)

De Ridder et al. (2015)



CLIMATE ADAPTATION – IMPACT OF URBAN GREEN INFRASTRUCTURE



Verspreiding: Beperkt



Eindrapport

Micro-analyse van het stedelijk klimaat van de Groenplaats

Dirk Lauwaet en Bino Maiheu

Studie uitgevoerd in opdracht van: Stad Antwerpen
2016/RMA/R/184
November 2014




VITO NV
Borreling 200 - 2400 MOL - BELGIË
Tel. +32 14 23 50 11 - Fax +32 14 23 55 99
vito@vito.be - www.vito.be

BTW BE-0244 195 910 RPH (Taruhour)
Bank 975 1127504 90 060
BE34 3751 1173 5400 - IBBRUEBB

RMA/1410747/2014

Lauwaet and Maiheu (2014)