This documentation is part of the compilation of files related to Pedersen, Agnethe Nedergaard; Pedersen, Jonas Wied; Vigueras-Rodriguez, Antonio; Brink-Kjær, Annette; Borup, Morten; Mikkelsen, Peter Steen (2021): Dataset for Bellinge: An urban drainage case study. Technical University of Denmark. Collection.
https://doi.org/10.11583/DTU.c.5029124
Catchment description, version 2, 31-08-2021

Catchment description [#8]

This document describes the content in the "Catchment description" folder.

The delineation and characterization of each subcatchment in the Mike Urban model is based on land-use categories identified by spectral analysis according to the method described in (Kaspersen et al., 2015) together with manual registration of roads based on e.g. data from SDFE (Agency for Datasupply and Efficiency) (see folder with Ortho-photo, DTM etc.).

The imperviousness for each catchment was calculated as an area-weighted mean of the imperviousness of the various land-use categories within a catchment. The different land-use categories, referred to as classes, can be seen in Table 1 along with two sets of parameter values of imperviousness, which are both based on experience. The "SA" parameter set is suggested by an end-user with many years of experience with urban drainage modelling and interpretation of hydrological catchment response. The "Other" parameter set has been slightly modified and adjusted for the catchment area upstream from G71F68Y, the basin, in order to provide a better fit of model results to sensor measurements. The extent of the two parameter sets can be seen in Figure 1. The final imperviousness for each catchment can be seen in Figure 2.

*Table 1: Area classes distinguished in the spectral analysis. *Some areas have 60 and 80 imperviousness percentage.*

Class	Description	Imperviousness percentage for class	
		SA (standard)	Other
1	House	100	95
2	Roads	100	90
3	Pavement	50	50
4	Parking	80	60
5	Other impervious less than 13 m from road	25	25
6	Internal roads	80	60
7	Other roads	80	60
8	Driveways	80	60
9	Areas with road-screens	80	60
10	Garages	100	100
11	Annex	100	100
12	Greenhouses	0	0
13	Houses <50 m2 and more than 20 m from road	0	0
14	Other impervious without category*	0	0
15	Lakes	100	100
16	Artificial turf	100	100
49	Houses and areas not connected to urban drainage system	0	0

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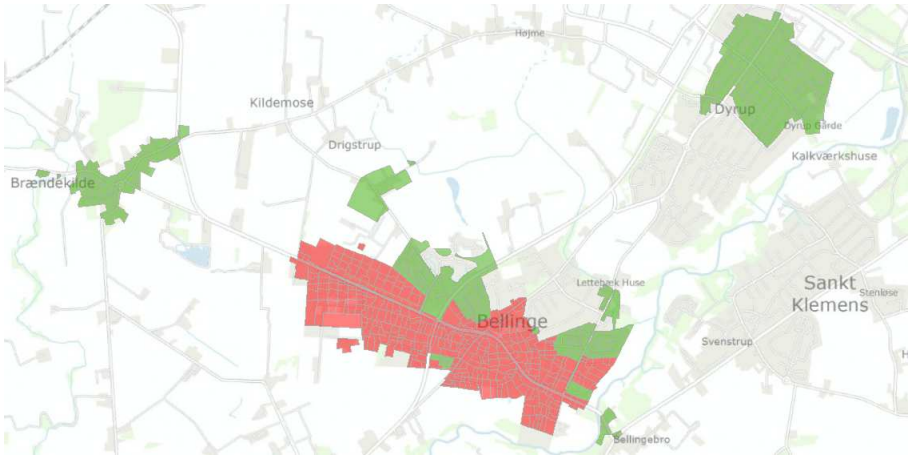

Figure 1: Spatial coverage of imperviousness parameter sets. Green areas have "standard SA" (spectral analysis) parameters while red areas have parameter set "other" with adjusted parameters.

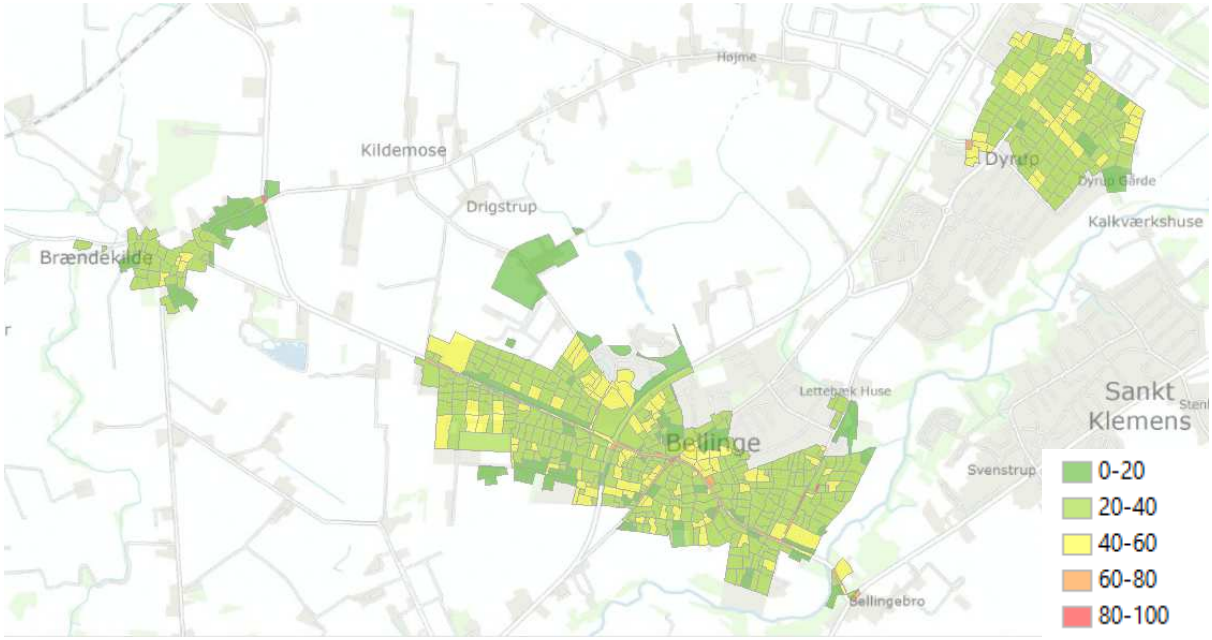

Figure 2: Imperviousness percentage for each catchment. Unit [%]

The time of concentration of subcatchments was assessed with a simple rule-based method, as indicated in Table 2.

Table 2: Rule-based estimation of time of concentration for the catchment areas.

Catchment total area [ha]	TOC [min]
<1	5 min
1-5	7 min
5-10	10 min

>10	Estimated individually

Geodetic reference system:

The data provided is in coordinate system ETRS89 UTM 32N and with reference level DVR90 (Danish Vertical Reference 1990, https://eng.sdfe.dk/product-and-services/professional-users/). The levels in the urban drainage system were initially measured in DNN (Danish normal zero) but were later converted to DVR90. The difference in these two reference levels is 0.081 m (DVR90 = DNN – 0.081m).

References

Kaspersen, P. S., Ravn, N. H., Arnbjerg-Nielsen, K., Madsen, H. and Drews, M.: Influence of urban land cover changes and climate change for the exposure of European cities to flooding during high-intensity precipitation, , 370, 21–27, doi:10.5194/piahs-370-21-2015, 2015.