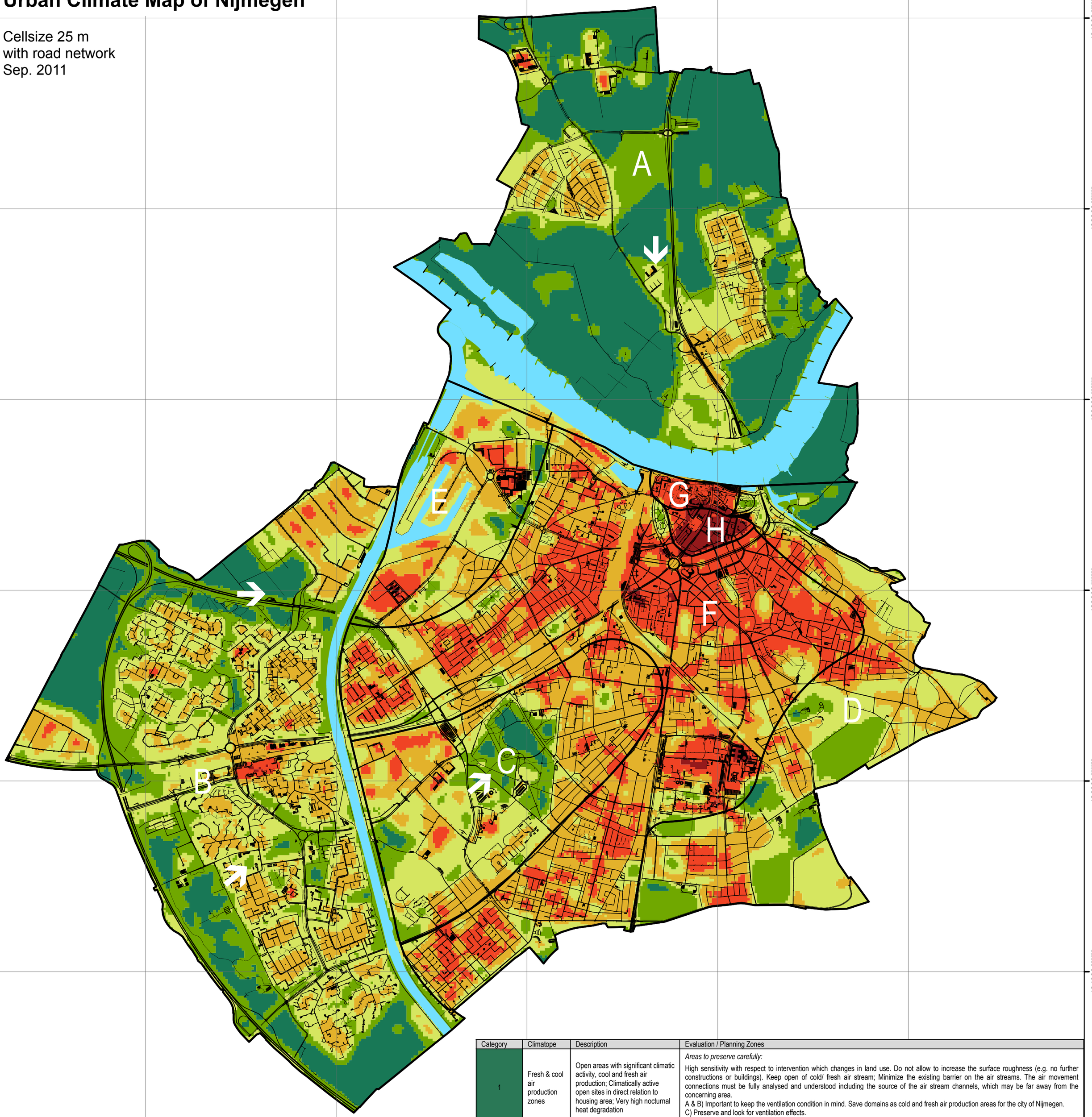
Urban Climate Map of Nijmegen

Cellsize 25 m
with road network
Sep. 2011



Category	Climatope	Description	Evaluation / Planning Zones
1	Fresh & cool air production zones	Open areas with significant climatic activity, cool and fresh air production; Climatically active open sites in direct relation to housing area; Very high nocturnal heat degradation	*Areas to preserve carefully:* High sensitivity with respect to intervention which changes in land use. Do not allow to increase the surface roughness (e.g. no further constructions or buildings). Keep open of cold/ fresh air stream; Minimize the existing barrier on the air streams. The air movement connections must be fully analysed and understood including the source of the air stream channels, which may be far away from the concerning area. A & B) Important to keep the ventilation condition in mind. Save domains as cold and fresh air production areas for the city of Nijmegen. C) Preserve and look for ventilation effects. D & E) Preserve and try to connect areas among each other in each planning zone.
2	Cool air production zone	Open areas with less significant climatic activity; Cool & fresh air with effects to neighborhoods; Areas without any emissions; High nocturnal heat degradation	*Areas to preserve:* The increasing surface roughness (e.g. further constructions or buildings) can only be allowed if they respect slope winds and thermal induced circulation pattern; furthermore, redevelopments should only be allowed in exception case, which is supported by detailed investigation and analysis on climatic function aspect. A & B) Important to keep the ventilation condition in mind. Save domains as cold air production areas. C) Expand and promote these areas for important and useful linkage to provide a higher cooling rate towards the inner city. Important to notice ventilation. D & E) Try to create more small areas and linkage them. F) Very important to preserve the existing areas and link them together in ventilation direction. Promote green areas in the curtilage of buildings.
3	Mixed & transitional climate zone	Strong daily variation through income radiation, but good cooling effect; Areas with high percentage of vegetation; Low & discontinuous emissions; Buffer zones between different climatope; Moderate / good nocturnal heat degradation	*Areas with possible development:* Important linkage areas, foresee the orientation and density of buildings, surface roughness should not be in-creased due to reduction in ventilation with effect on neighbourhoods A & B) Important areas to ensure good aeration and ventilation. Avoid buildings if possible. In the case of buildings a porous structure and low storey number is to prefer. C, D, E & F) Important buffer zones in the inner city area, the conservation and expansion is desirable. Linking these areas to adapt to the direction of ventilation.
4	Overheating potential zone	Some heat storage but mainly buffered through greeneries and wind; Dominated construction areas with lots of vegetation in the open spaces; Low nocturnal heat degradation	*Development allowed:* No appreciable sensitivity in terms of climate with respect to intensification of use and building agglomeration. Generally redevelopment is possible if they take care about ventilation and if the ratio between built up area versus green area is maintained/respected. A, B & C) Further compression only selectively. Pay attention to building orientation to not affect local and regional circulation. F) Improve the areas in conjunction with category 3, to bring about better ventilation.
5	Overheating zone 1	Heat storage remarkable but still some wind effects and cooling potentials; Density development with little vegetation in open spaces; Very low nocturnal heat degradation	*Areas for improvement and plan actions are necessary:* Risk of future heat stress with some ventilation. So generally the areas should be maintained or improved, and not worsen. Development can only be allowed with compensation for climate effects. The existing air circulation should be analysed before any proposed change so that the urban climate is respected A, B, C, D & E) Careful in further compaction on floor height, building orientation, as well as building density (try to keep a high percentage of open space). F) Minimize the heat load with lower density between new buildings and a high percentage of unsealed parts. G) New ventilation areas can be created by loosening up of the development. H) Improve these parts by providing more greenery and shadow. Promote micro climate island solution.
6	Overheating zone 2	Heat storage high; Low cooling potentials and low ventilation; Heavily compressed and sealed inner city areas; No / very low nocturnal heat degradation	*Areas for improvement and plan actions are necessary:* In need of renewal from the point of view of urban climate. Greenery for facades and surfaces are needed. Increasing of existing heat stress, due to the accumulated problems on thermal load in the high dense built-up area, the climatic condition of this zone should be improved. Development in this zone is allowed only if enough compensation is done. Improving air exchange is one major recommendation together with shadow providing design. E & F) No more congestion of building in these areas. Moderate the heat load e.g. by green facades. G) Reduce the heat load by increasing the cooling effect by creating links to ventilation areas. H) Individual measures of creating shading and reduced heat storage. Try to reduce the heat load by creating more shadow, and trees. Promote micro climate island solution.
		Regional Ventilation	
A - H		Planning Zone	

N

0 550 1.100 2.200 3.300 Meters

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