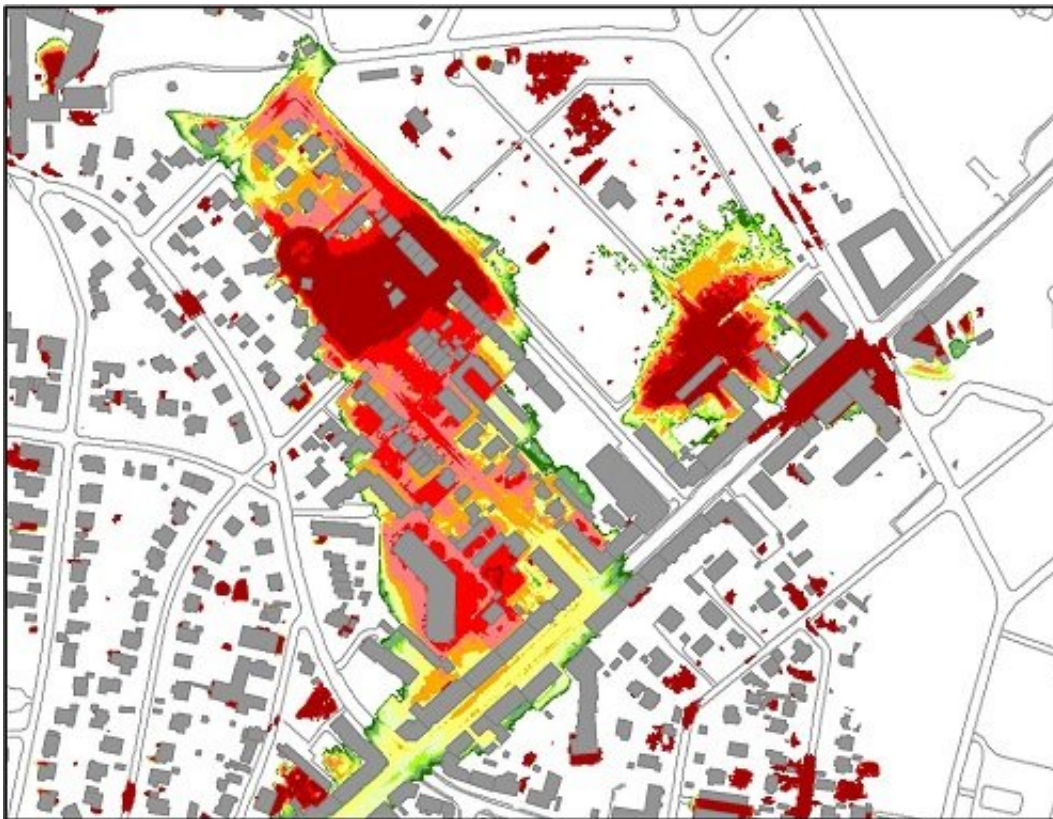


Free tool predicts if the next downpour will flood your basement

November 27 2018



Maelstrom shows which buildings are in critical locations. Credit: University of Copenhagen

A free digital tool allows users to identify drainage patterns from deluges and identify highly vulnerable areas. The tool has been developed by a University of Copenhagen geographer with a flooded basement tale of

his own.

Cloudbursts will become ever more frequent events in Denmark's future, and every monster rain will also spawn monstrous repair bills for a great number of people. Associate Professor Thomas Balstrøm of the Department of Geosciences and Natural Resource Management knows this all too well from personal experience.

"My cellar flooded during the 2011 cloudburst over Copenhagen. A low-lying area of our garden rapidly filled with rainwater, water that eventually spilled through the cellar walls. This idea was born from that event, says Balstrøm, developer of the GIS-based tool called Maelstrom.

His idea was to develop a tool that presented an overview of the routes that water takes during cloudbursts and provide a map of where water will pool. Users can identify which buildings, roads, tunnels and installations are in critical locations. "When a municipality needs to find out where water will flow during torrential rains, they typically rely on an engineering firm to perform an analysis. This is an expensive proposition from the get go. Maelstrom is a tool that allows you to gain a quick overview, on your own, before resorting to more extensive and expensive solutions," says Balstrøm.

The tool is based on a publicly available elevation model. It uses a digital map to show where low lying hollows are and where runoff will pool during cloudbursts. The map also details how many millimeters of precipitation are needed to fill individual depressions in the [landscape](#) and where overflow will run from there. In short, Maelstrom maps waterway networks.

The information is useful for building planning, climate renovation projects and for anyone who needs to effectively position emergency preparedness resources for cloudbursts," says Balstrøm.

Maelstrom is intended as a free product that is untied to commercial interests and will be released with an open-source license. "The idea is that Maelstrom should be available to all—both here at home, as well as in developing nations, so that anyone in any sector can gain an initial appraisal before spending money on more in-depth research. This type of screening tool, one that runs on an ordinary PC, is currently nonexistent," says Balstrøm.

"I think that there is a significant and unmet demand because of the wide variety of actors who are affected when cloudbursts occur. These might be [landscape architects](#), those working on climate renovation projects, public agencies, the Danish State Railways, the Danish Road Directorate, and even energy companies. If you have electrical enclosures in low lying areas, they will simply explode when flooded. And that costs a fortune for energy companies," concludes Balstrøm.

Provided by University of Copenhagen

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