Using urban runoff simulations for addressing climate change impacts on urban runoff quality in a Swedish town

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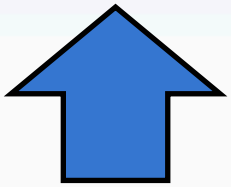
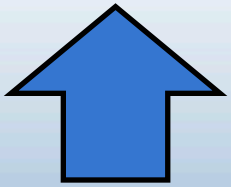
Urban stormwater quality

Build-up

Wash-off



Rain characteristics



Climatic changes

Approach

Using an urban runoff model for comparing sets of stormwater quality simulations for a test catchment and the current and future climate scenarios

SWMM-engine

- Developed in the 1970s
- Successfully applied for the simulation of stormwater processes
- Hydrographs are calculated based on physical properties
- Build-up during dry days; wash-off and transport of pollutants during rain events

Best practical estimates for quality parameters (TSS)

21 rain events with relatively short return intervals

Modification by increasing the intensity by 20 %

Changes for, runoff flow, event mean concentration (EMC) and wash-off load

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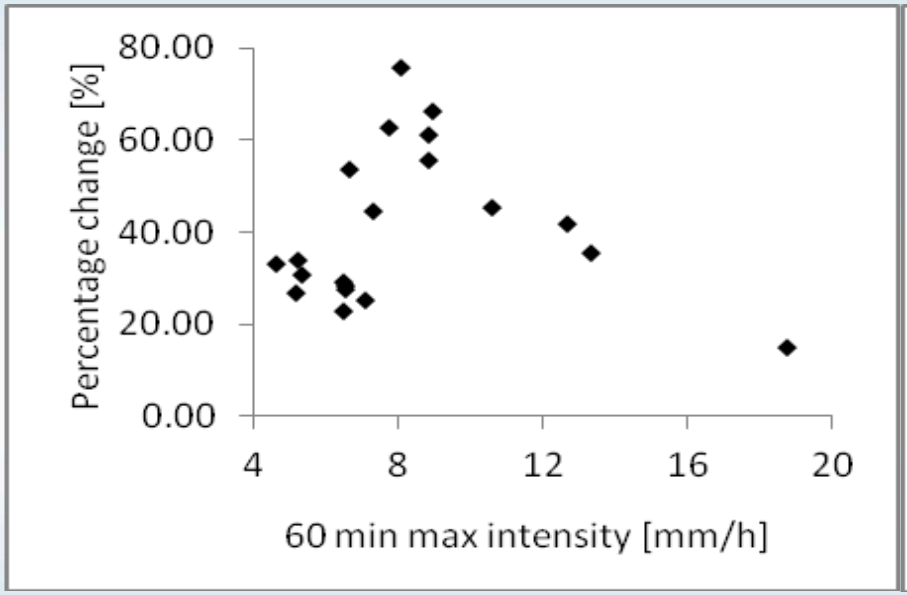
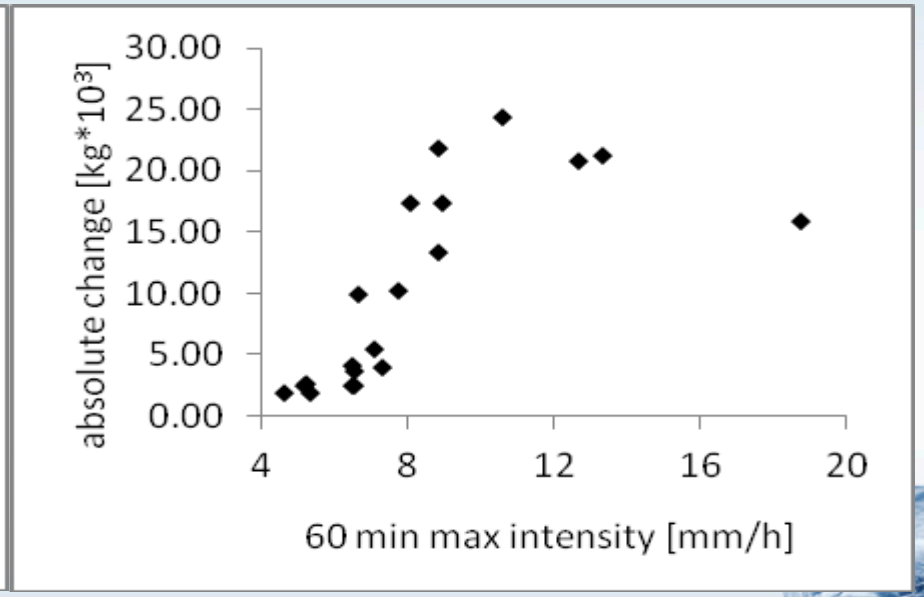
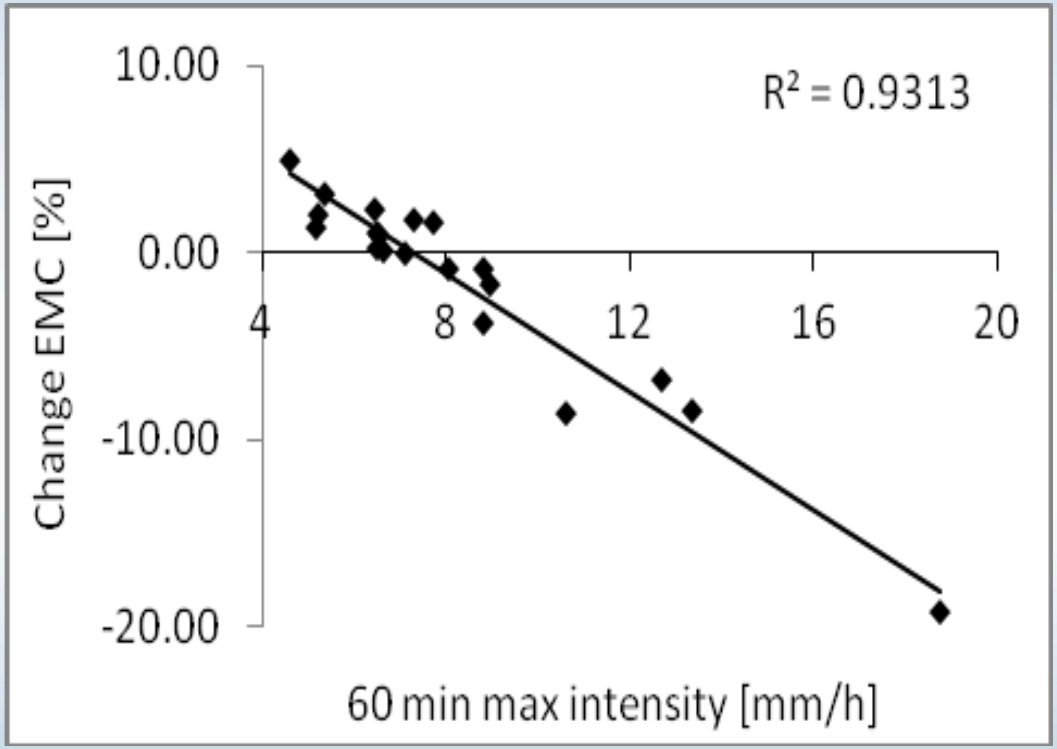
Event	Depth [mm]	Duration [h]	60 min max Intensity [mm/h]	Change Runoff [%]	Change Wash-off load [%]	Change EMC [%]
1	6	7.8	4.6	26.6	33	5
2	14.9	3.3	8.1	77.3	75.8	-0.9
3	39.4	8.3	18.8	42.2	14.8	-19.3

Changes for wash-off load





Changes for EMC



Summary

- **A changing climate characterized by higher intensity storms influences the simulated stormwater quality.**
- **Stormwater quality for frequent low-to-medium intensity storms was sensitive to climate changes.**
- **Rain events with a high intensity and volume show decreasing EMCs for the climate change scenario studied**
- **Pervious areas are likely to have a significant influence on the runoff and pollution generation processes**
- **Significant implications for stormwater management.**

Thank you for you attention!