Reviewer 2. The topic of the article is interesting and stimulating. Here you can find my comments:

1. OVERALL: Please, enlarge and re-arrange font sizes to guide the reader properly in all sections. All figures must be composed of HD images. It is mandatory to improve the scientific quality of the whole manuscript.

The quality of the figures has been improved throughout the manuscript, and the font size for the main chapters has been increased to 12, and the subchapters to 10. In addition, graphic programs were used to improve the quality of the maps (S9 - S17); a sample drawing of S9 is provided.

In the revised manuscript, the following modifications were made:

Current version: **Highlight**

After modification: **Highlight** (L36)

Current version: **Introduction**

After modification: **Introduction** (L41)

Current version: **Case study**

After modification: **Case study** (L100)

Current version: **Methodology**

After modification: **Methodology** (L100)

Current version: **Results**

After modification: **Results** (L365)

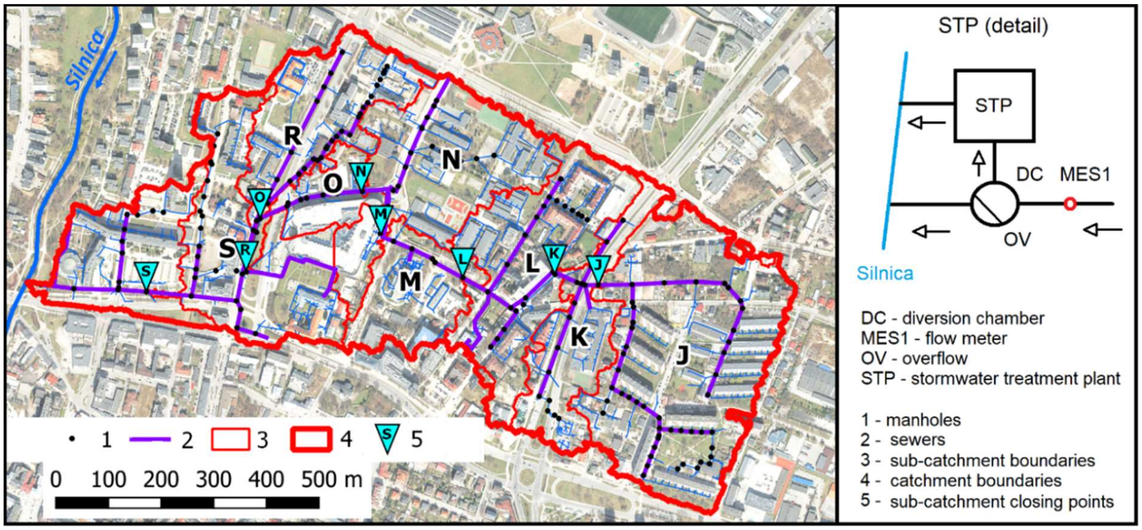

Figure. 1. Study catchment area (Wałek, 2019).

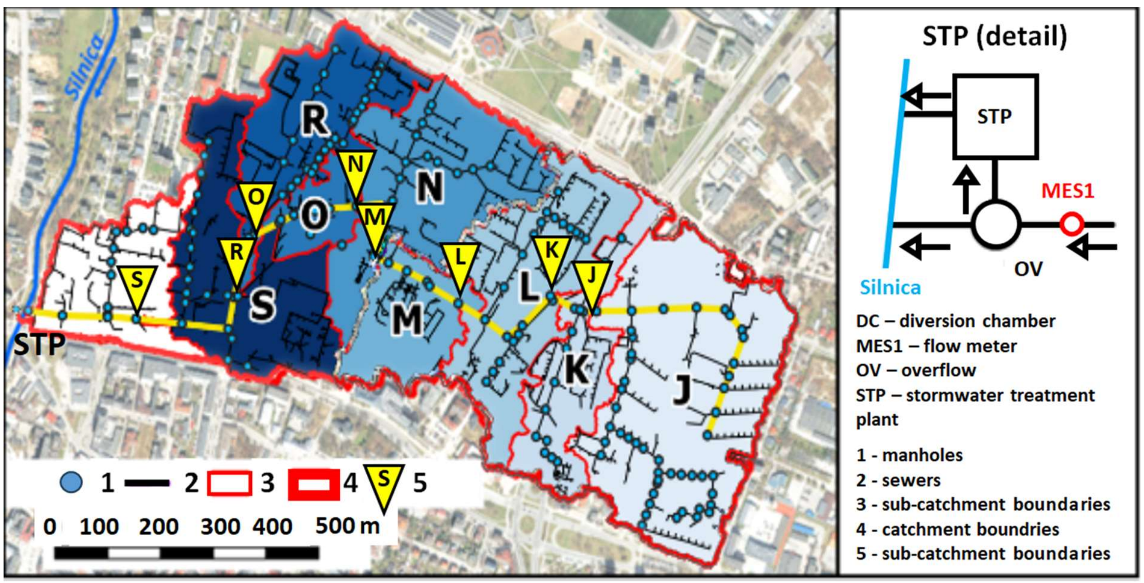

Figure. 1. Study catchment area (Wałek, 2019). (L104)

current version

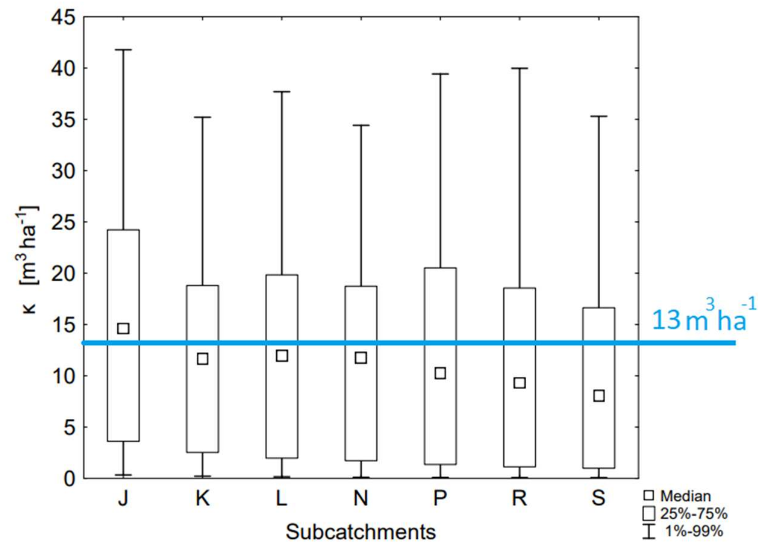

Figure. 3. Variability of specific flood volume for sub-catchments.

after modification

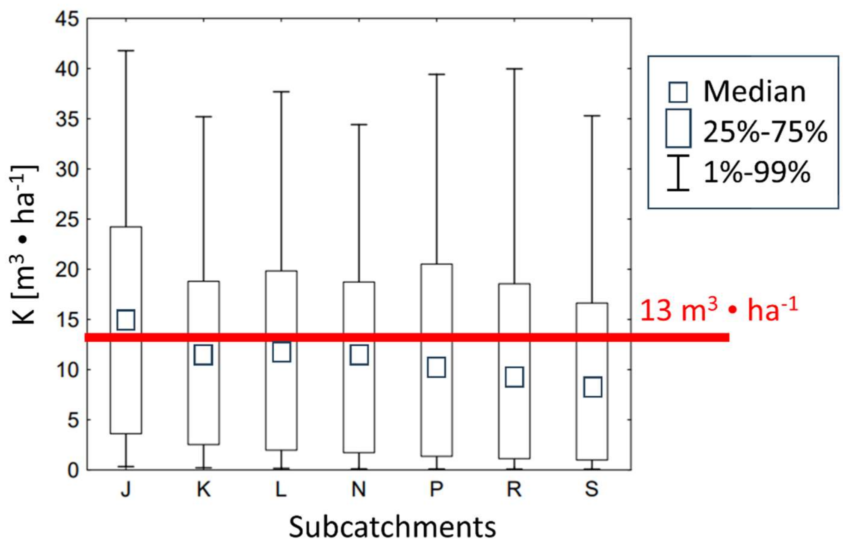

Figure. 3. Variability of specific flood volume for sub-catchments. (L381)

current version

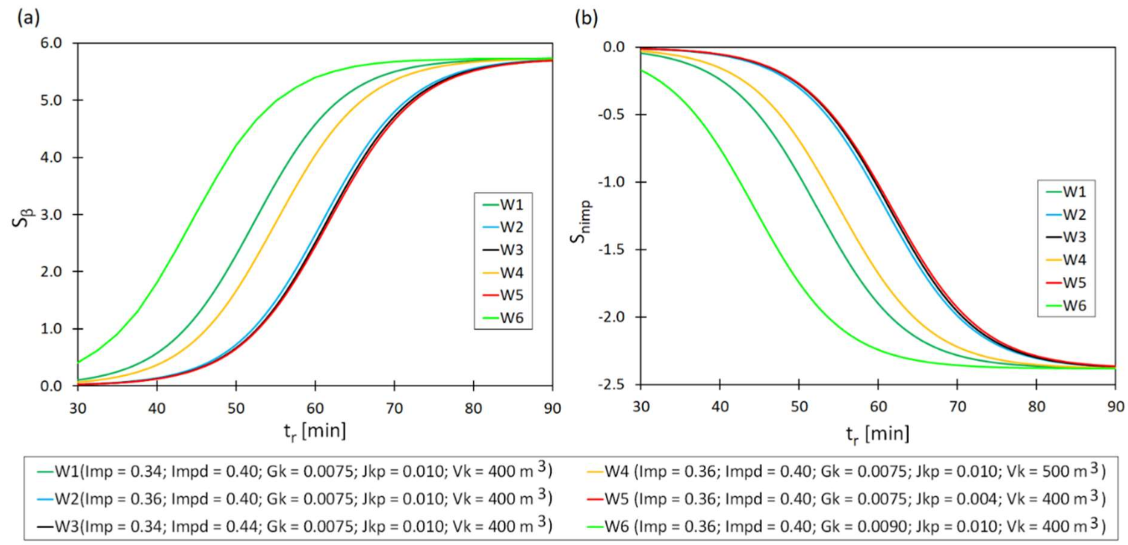

Figure 4. The impact of rainfall duration (t_r) and catchment characteristics (Imp, Impd, Vk, Jkp) on sensitivity coefficients: (a) S_β, (b) S_{nimp}.

after modification

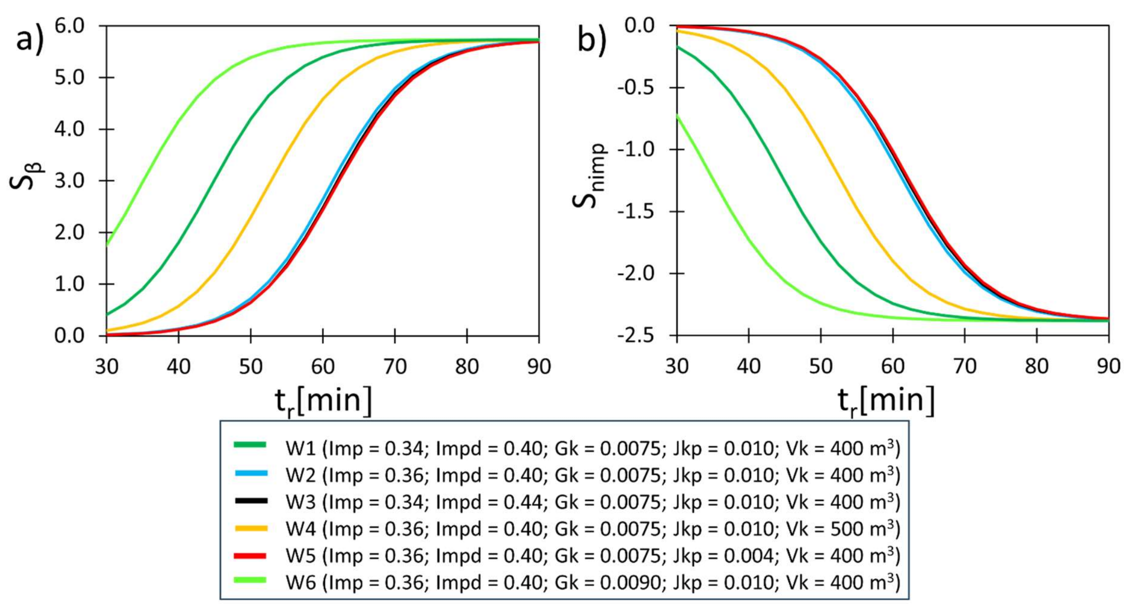

Figure 4. The impact of rainfall duration (t_r) and catchment characteristics (Imp, Impd, Vk, Jkp) on sensitivity coefficients: (a) S_β, (b) S_{nimp}. (L420)

current version

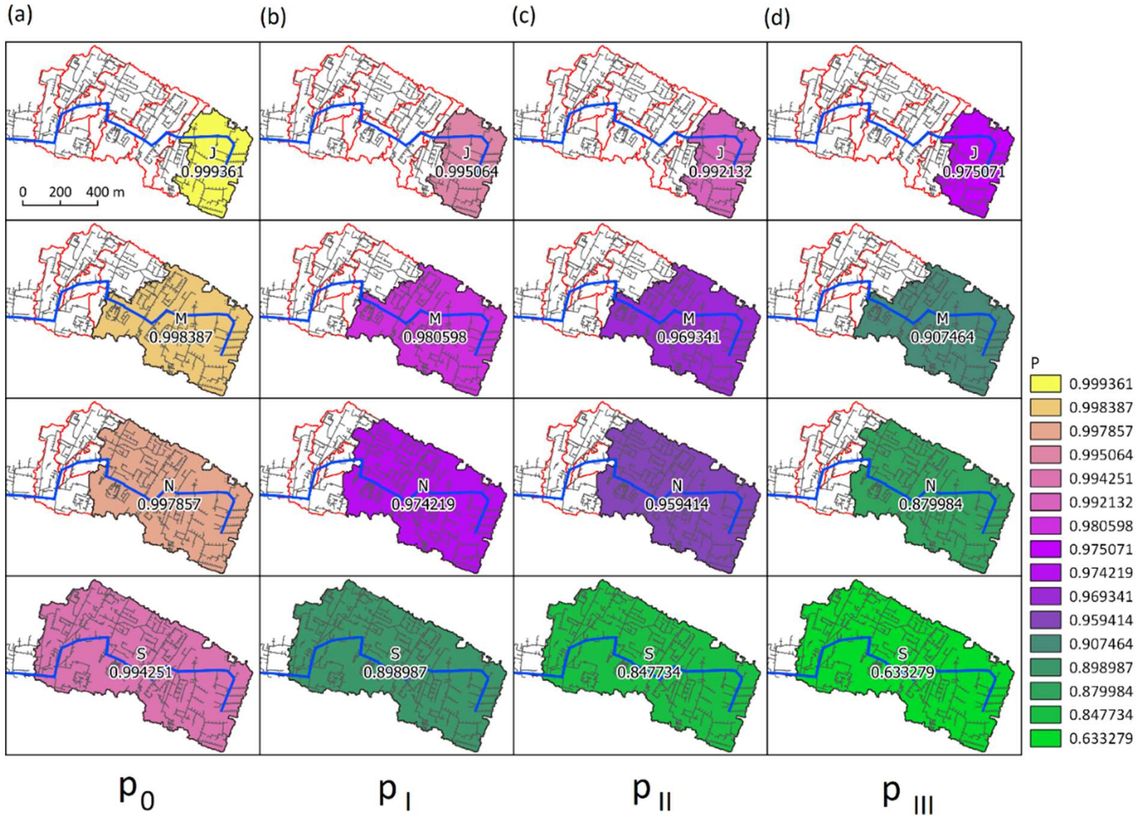

Figure 5. Probability of specific flood volume in sub-catchments for: (a) present state (p_0) and for (b) I, (c) II, (d) III corrective actions variants. (L446)

current version

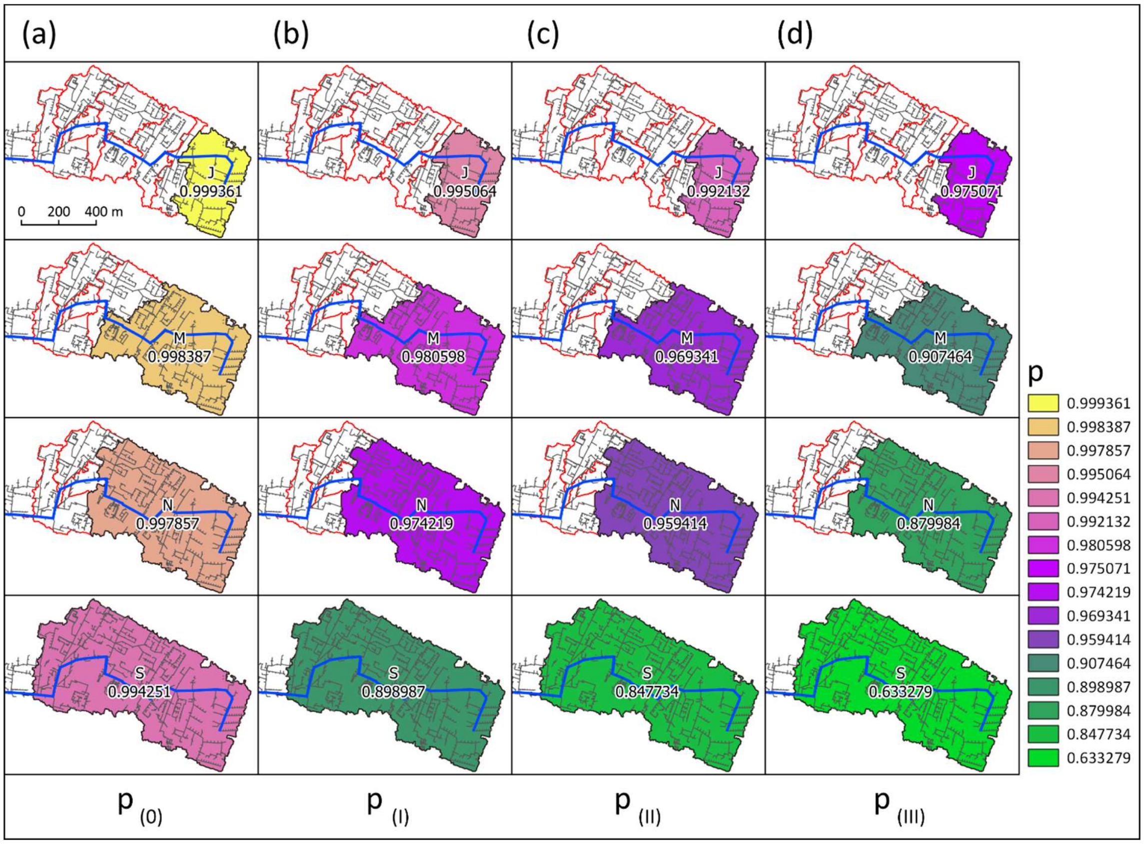

Figure 5. Probability of specific flood volume in sub-catchments for: (a) present state (p_0) and for (b) I, (c) II, (d) III corrective actions variants. (L453)

current version

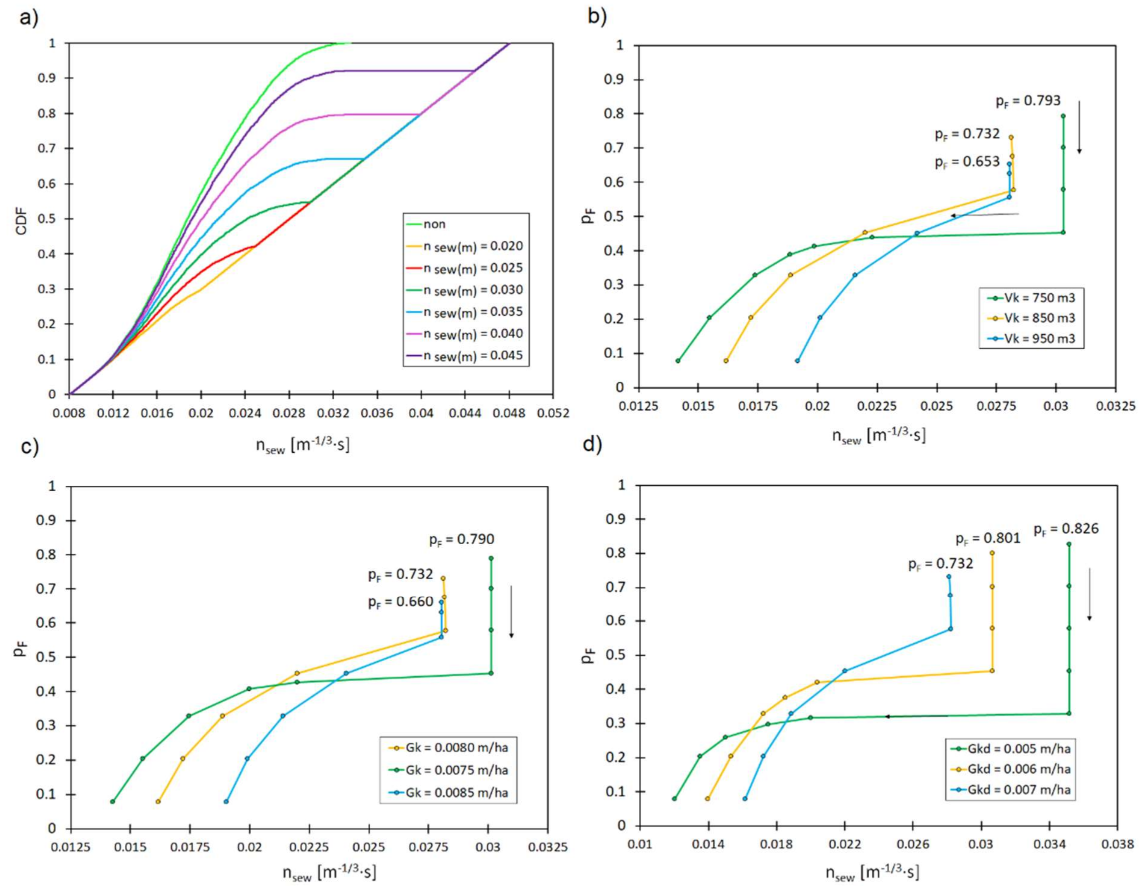

Figure 8. (a) Empirical distributions of threshold values of Manning roughness coefficients of channels (n_{sew}) for Vk = 950m^3. Impact of Manning roughness coefficient for channel on failure probability (p_F) in relation to: (b) Vk – canal retention, (c) Gk - length of stormwater channel per impervious area in a catchment (m·ha^{-1}), (d) Gkd - length of a channel per impervious area below closing cross-section (m ha^{-1}).

after modification

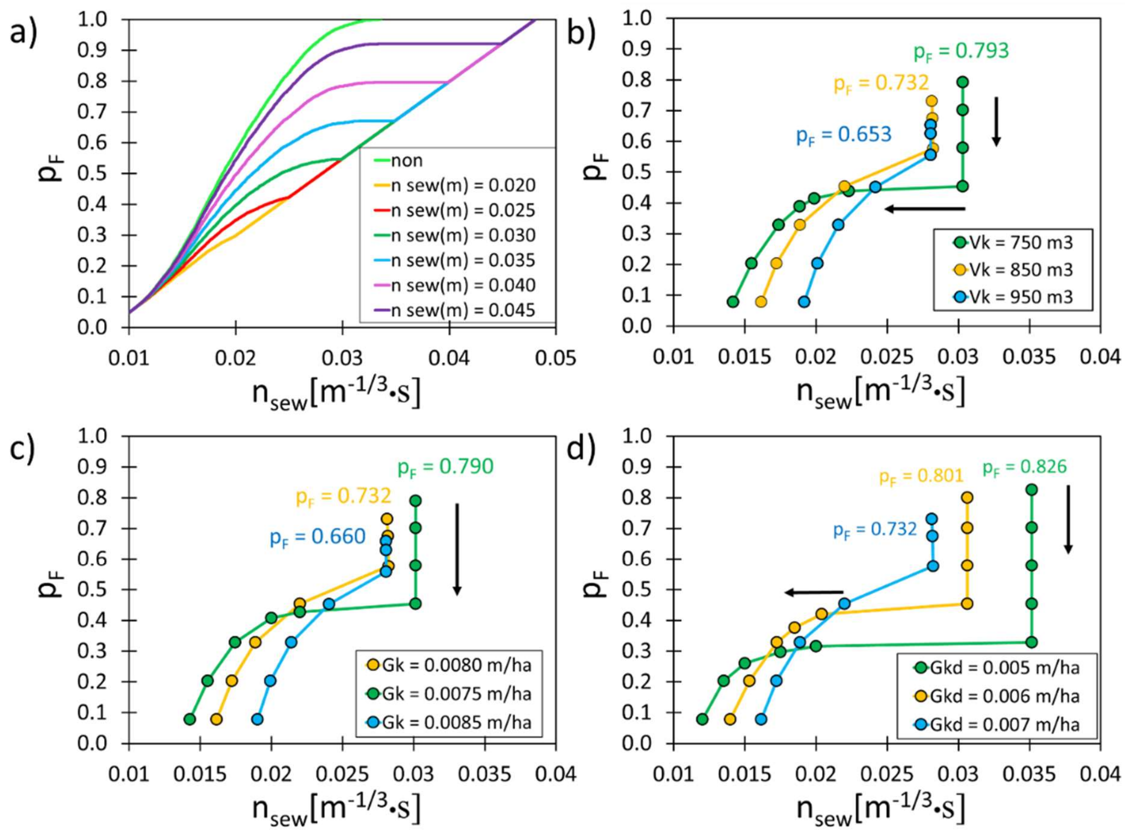

Figure 8. (a) Empirical distributions of threshold values of Manning roughness coefficients of channels (n_{sew}) for Vk = 950m^3. Impact of Manning roughness coefficient for channel on failure probability (p_F) in relation to: (b) Vk – canal retention, (c) Gk - length of stormwater channel per impervious area in a catchment (m·ha^{-1}), (d) Gkd - length of a channel per impervious area below closing cross-section (m ha^{-1}). (L501)

current version

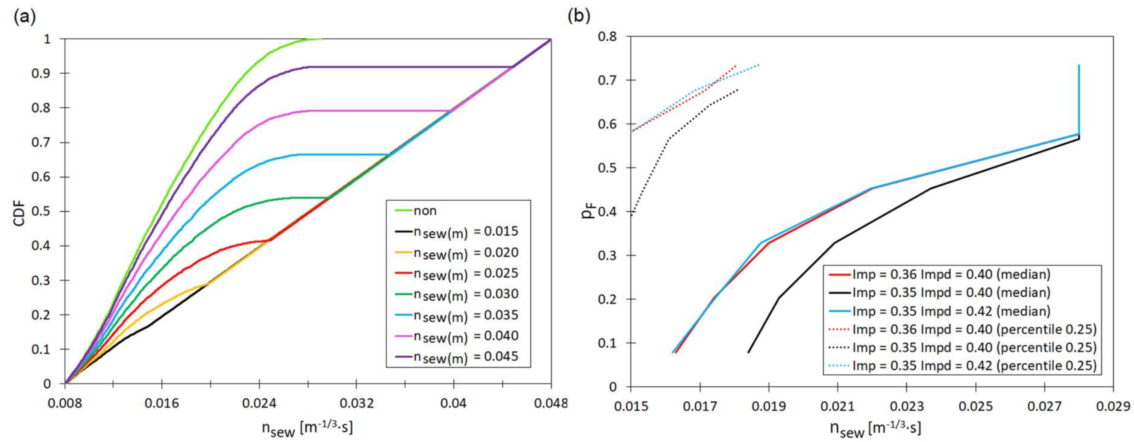

Figure 7. (a) Empirical distributions of threshold values of Manning roughness coefficients of channel (n_{sew}). (b) Impact of Manning roughness coefficient of channel on failure probability (p_F) in relation to Imp, Impd.

after modification

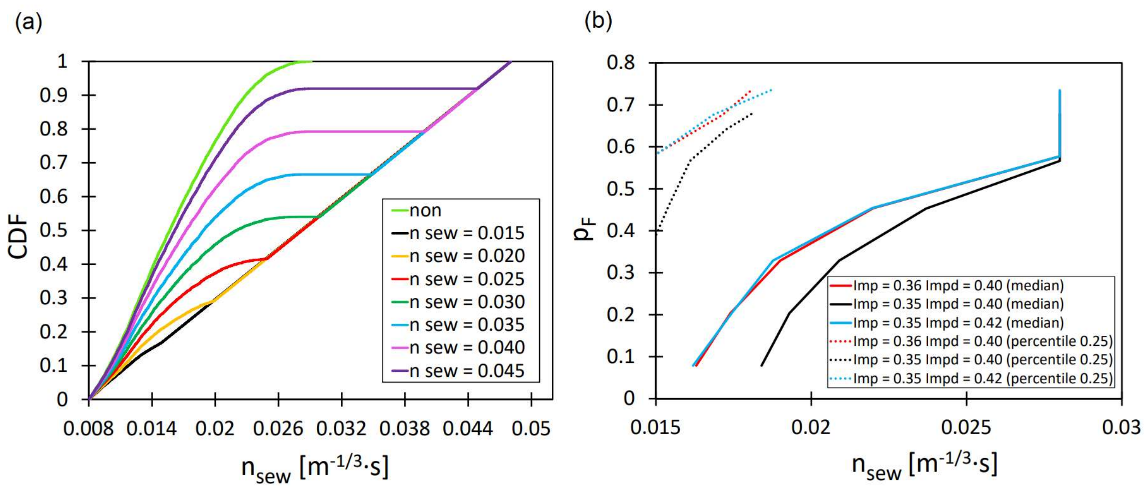

Figure 7. (a) Empirical distributions of threshold values of Manning roughness coefficients of channel (n_{sew}). (b) Impact of Manning roughness coefficient of channel on failure probability (p_F) in relation to Imp, Impd. (L482)

current version

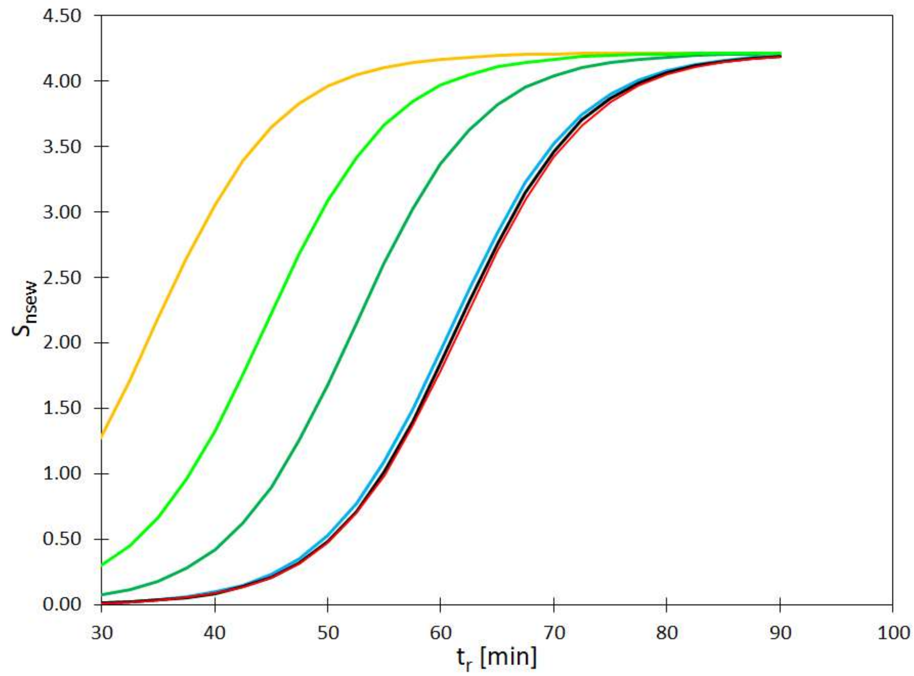

Figure S4. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_{nsew}.

after modification

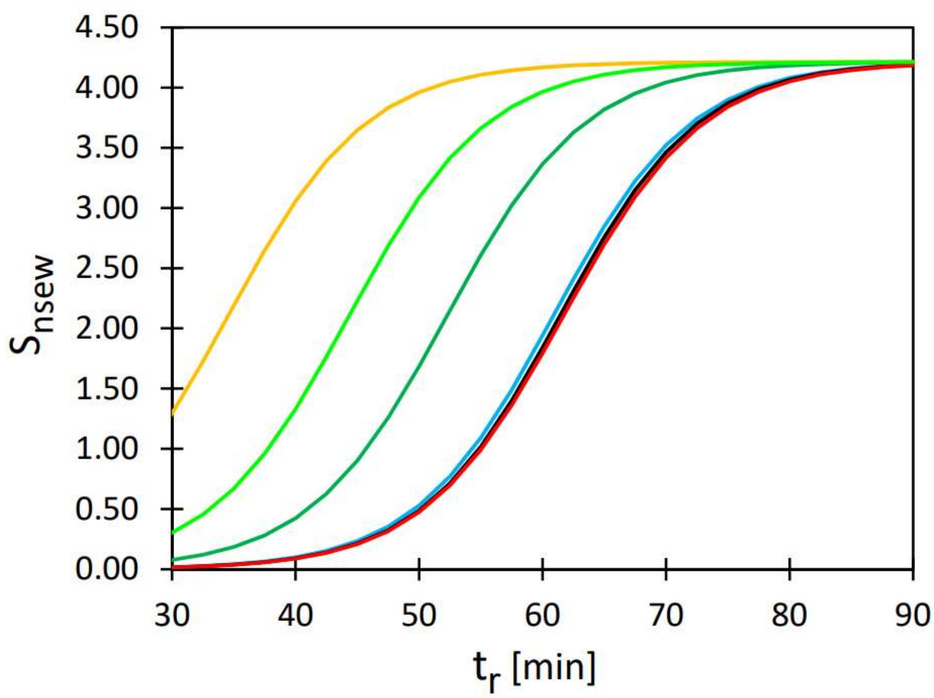

Figure S4. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_{nsew}. (L151)

current version

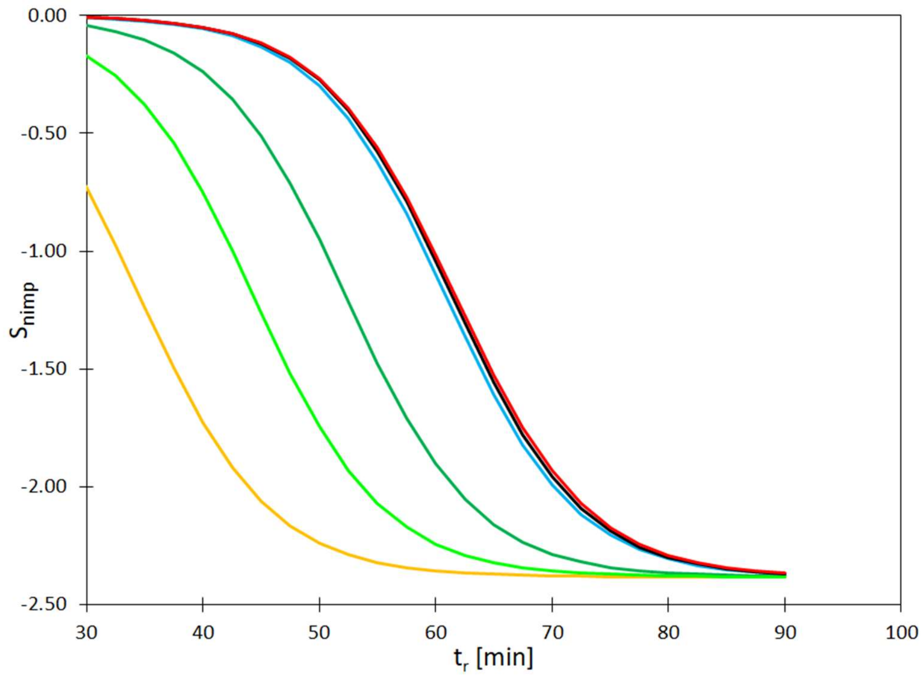

Figure S5. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_{nimp}.

after modification

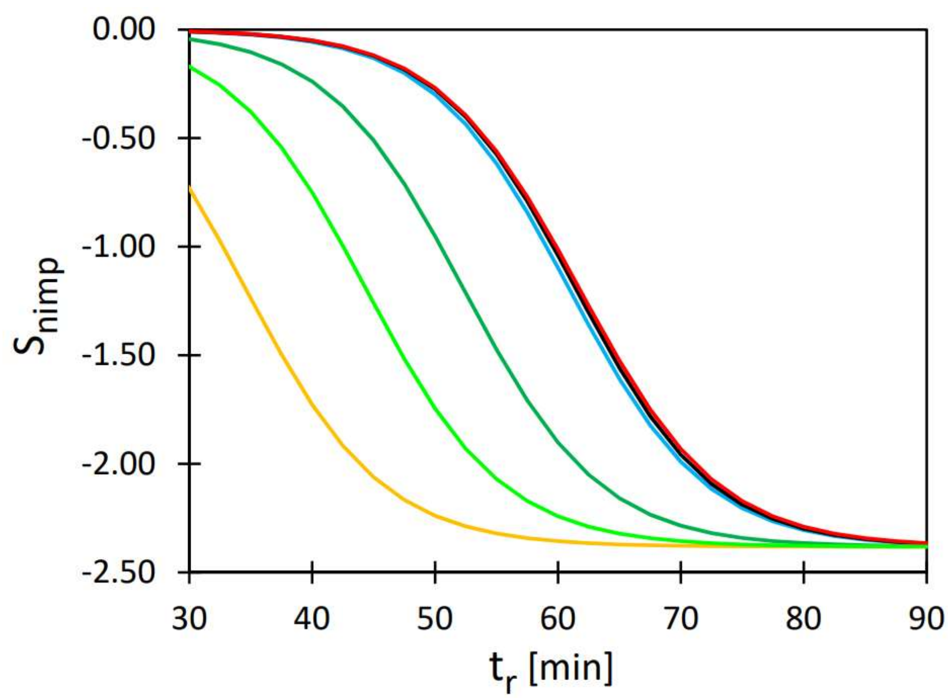

Figure S5. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_{nimp}. (L155)

current version

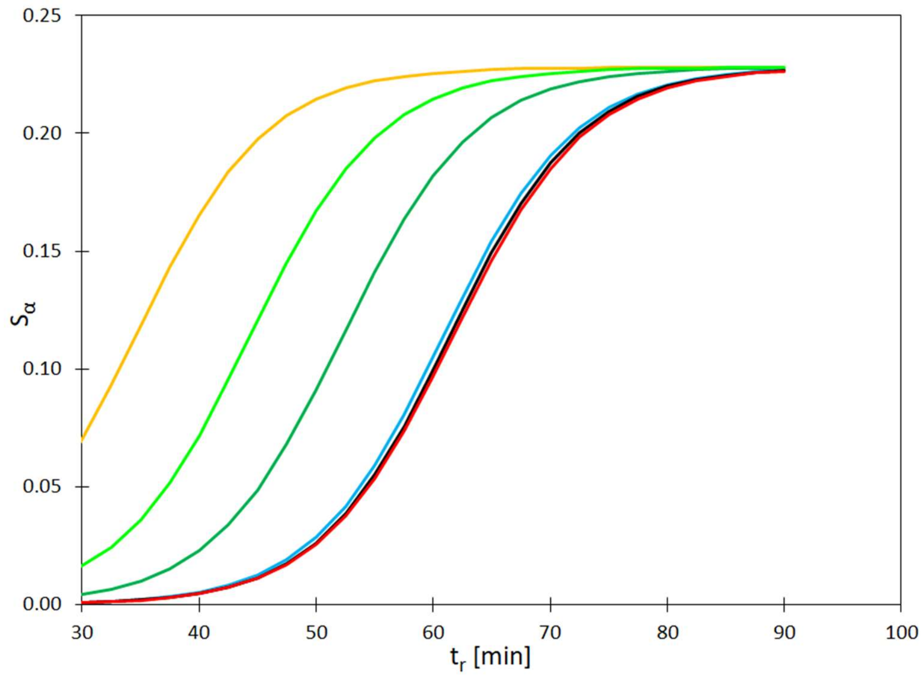

Figure S6. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_α.

after modification

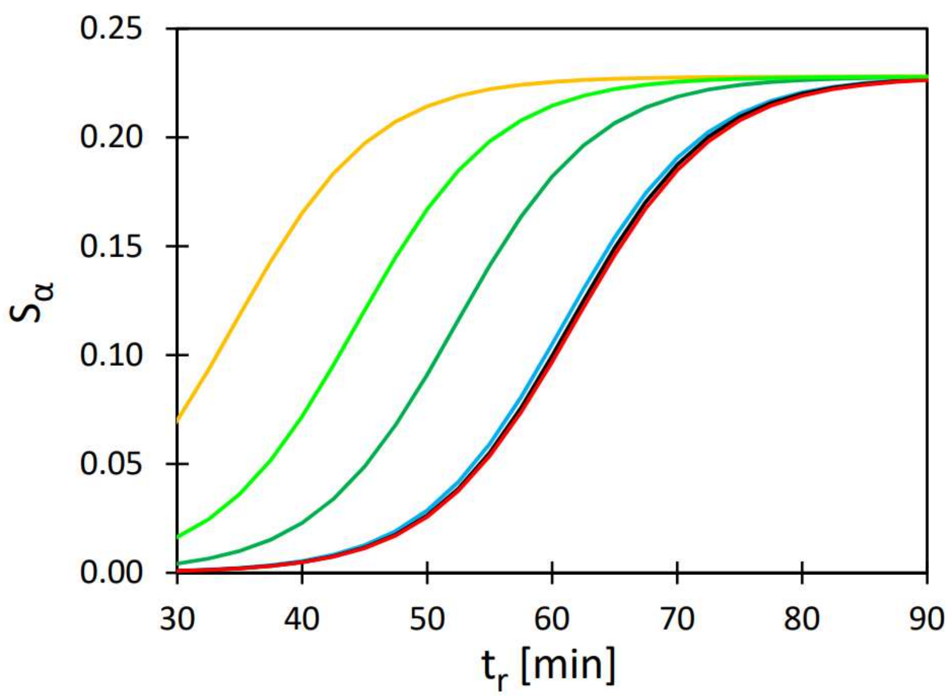

Figure S6. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_α. (L159)

current version

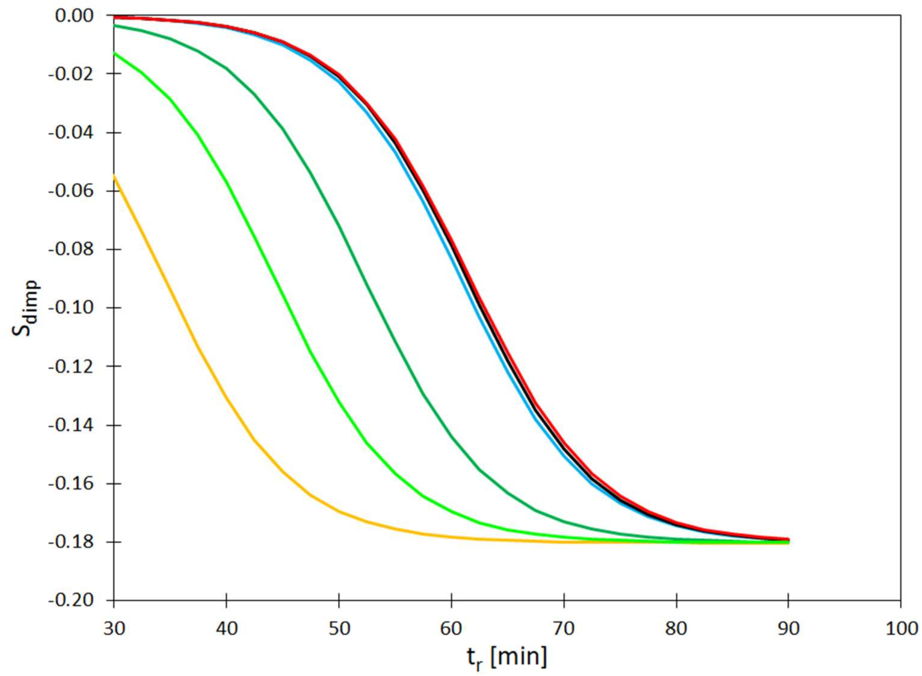

Figure S7. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_{dimp}.

after modification

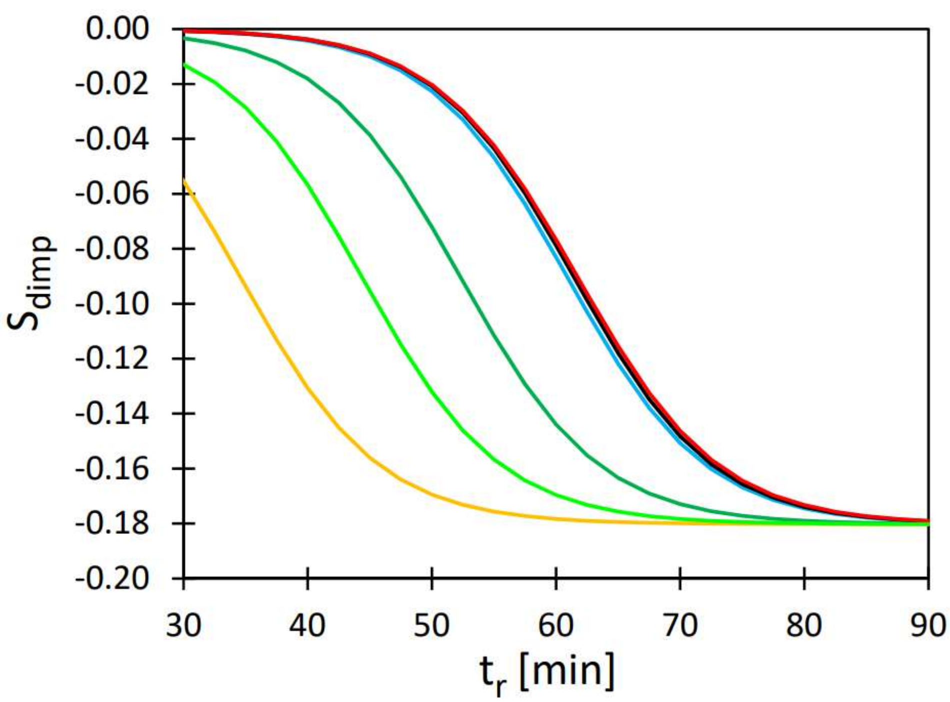

Figure S7. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_{dimp}. (L163)

current version

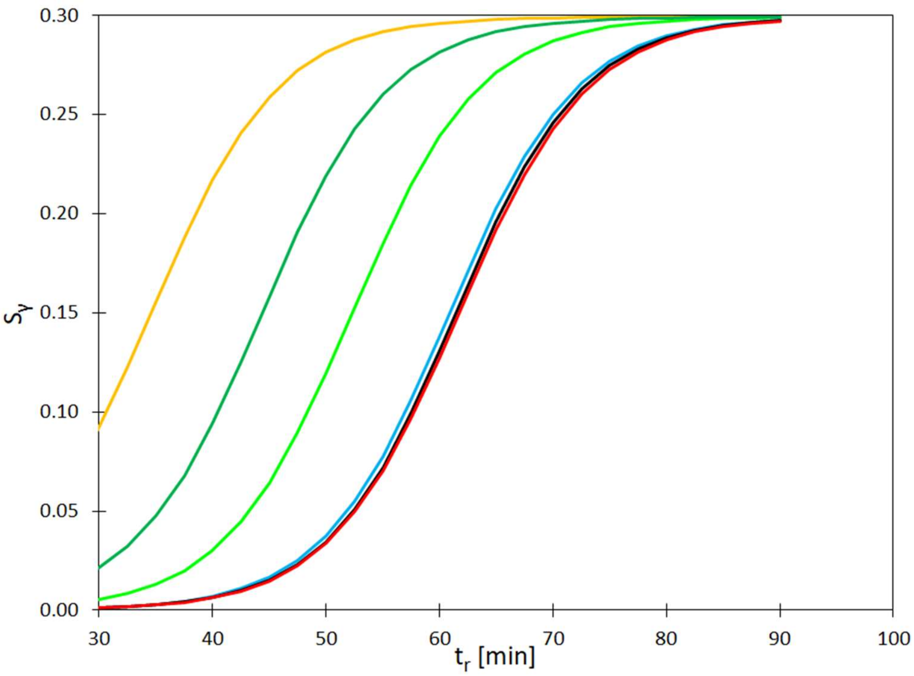

Figure S8. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_γ.

after modification

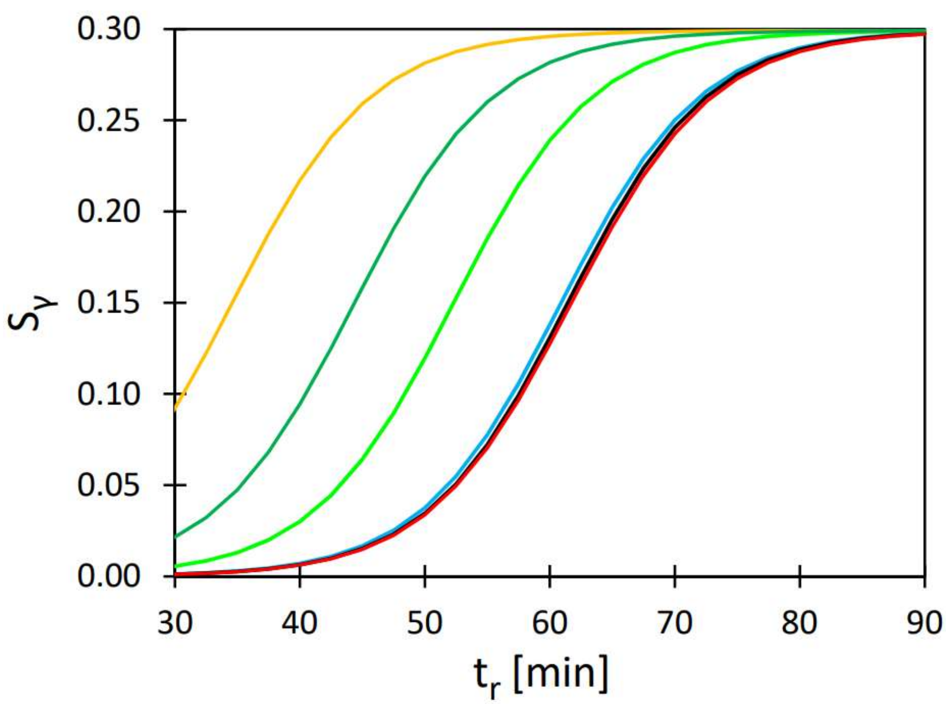

Figure S8. Influence of rainfall duration (t_r) depending on catchment and stormwater network characteristics (Imp, Impd, Vk, Jkp, Gk) on the sensitivity coefficient S_γ. (L167)

current version

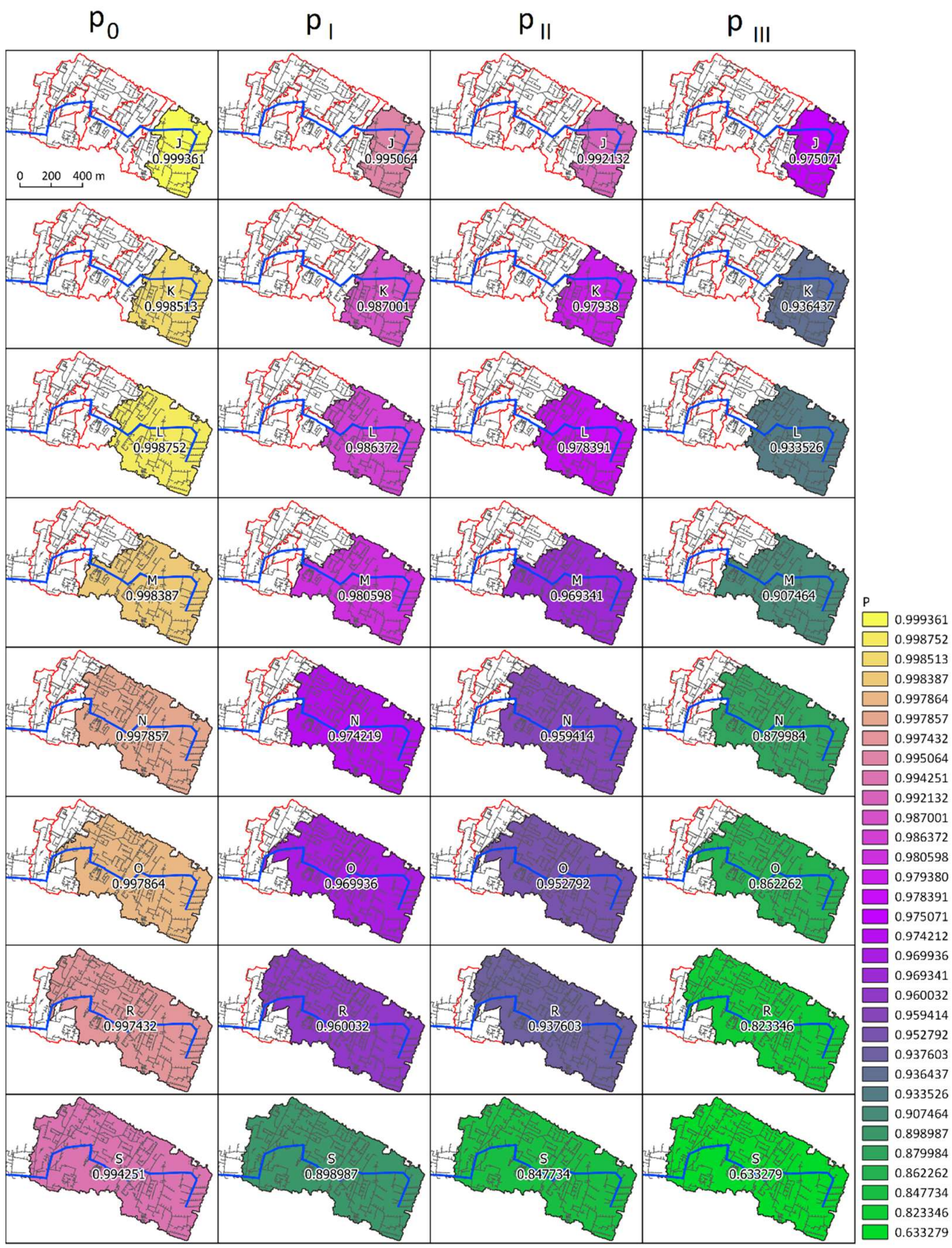

Figure S9. Probability of specific flood volume for separate sub-catchments (J, K, L, M, N, O, R, S) for the current state and corrective variants (I, II, III).

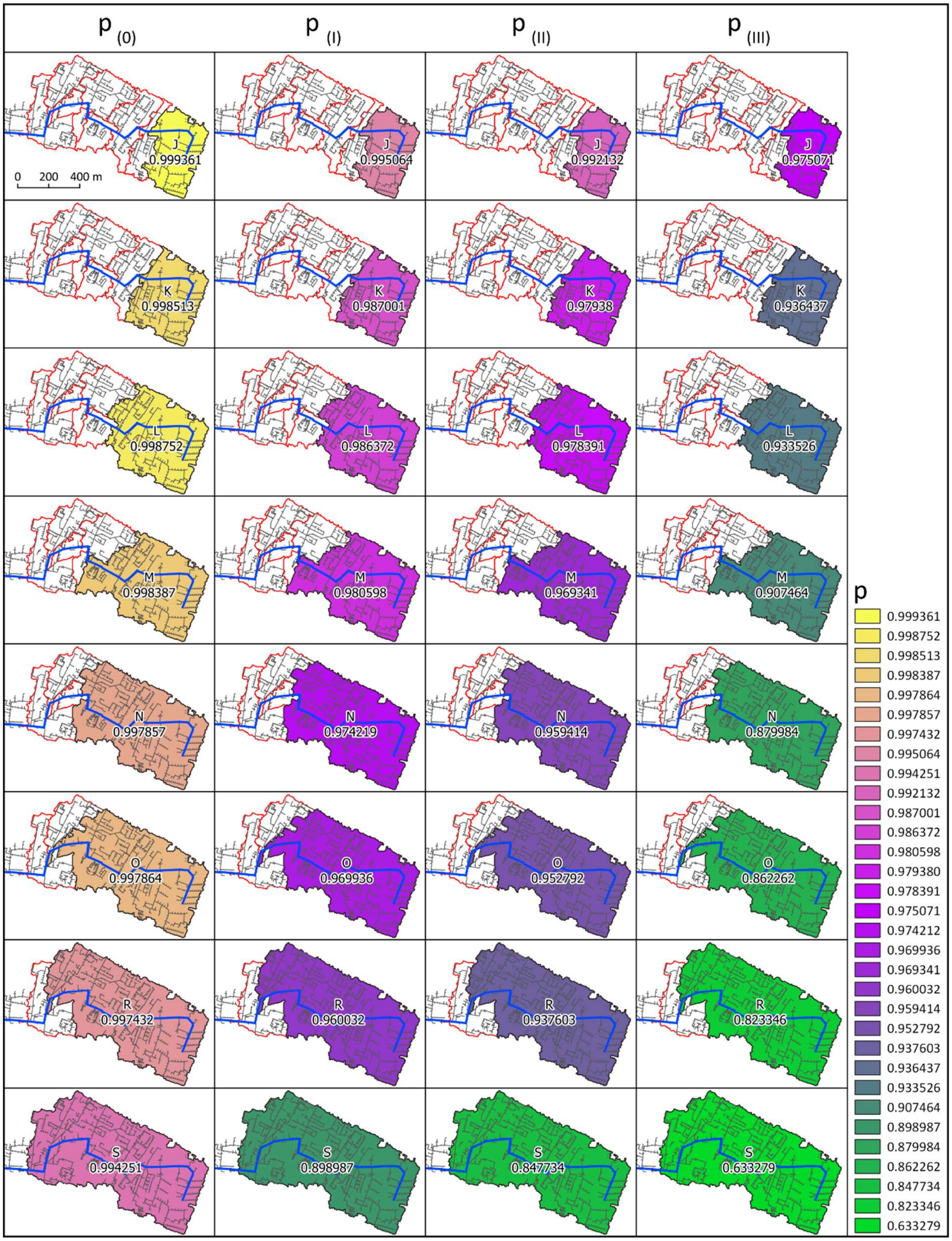

Figure S9. Probability of specific flood volume for separate sub-catchments (J, K, L, M, N, O, R, S) for the current state and corrective variants (I, II, III).

2. INTRODUCTION: Please, consider in the scientific background of your study the importance of the accuracy of indierect methods in the prediction and the monitoring of natural resources broadly speaking (i.e.,

Mohammad, L., Bandyopadhyay, L., Sk, R., Mondal, I., Nguyen, T.T., Lama, G.F.C., Ahn, D.T. 2023. Estimation of agricultural burned affected area using NDVI and dNBR satellite-based empirical models. Journal of Environmental Management, 343, 118226. https://doi.org/10.1016/j.jenvman.2023.118226.

Lama, G.F.C., Crimaldi, M., De Vivo, A., Chirico, G.B., Sarghini, F. 2021a. Eco-hydrodynamic characterization of vegetated flows derived by UAV-based imagery, 2021 IEEE International Workshop on Metrology for Agriculture and Forestry (MetroAgriFor), 273–278, doi:10.1109/MetroAgriFor52389.2021.9628749.

Ray, R., Das, A., Hasan, M.S.U., Aldrees, A., Islam, S., Khan, M.A., Lama, G.F.C. Quantitative Analysis of Land Use and Land Cover Dynamics using Geoinformatics Techniques: A Case Study on Kolkata Metropolitan Development Authority (KMDA) in West Bengal, India. Remote Sens. 2023, 15, 959. https://doi.org/10.3390/rs15040959.

Lense, G.H.E.; Lämmle, L.; Ayer, J.E.B.; Lama, G.F.C.; Rubira, F.G.; Mincato, R.L. Modeling of Soil Loss by Water Erosion and Its Impacts on the Cantareira System, Brazil. Water 2023, 15, 1490. https://doi.org/10.3390/w15081490.

Lama, G.F.C., Rillo Migliorini Giovannini, M., Errico, A., Mirzaei, S., Chirico, G.B., Preti, F. 2021b. The impacts of Nature Based Solutions (NBS) on vegetated flows' dynamics in urban areas, 2021 IEEE International Workshop on Metrology for Agriculture and Forestry (MetroAgriFor), 2021, 58–63. doi:10.1109/MetroAgriFor52389.2021.9628438)

In the revised manuscript, the following modifications were made:

„Climate change and urbanization are the main factors increasing the pressure on the functioning of sewer networks, in particular components responsible for stormwater management (Miller et al., 2014; Hettiarachchi, et al, 2018; Lama et al. 2021a; *Khan et al, 2022).*" (L42 – 44)

„This results in an increase in the frequency and volume of stormwater flooding, deterioration of the living standards of the inhabitants, and pipes abrasion (Jiang et al., 2018; Zhou et al. 2018; Chang et al. 2020; Lense et al. 2023)." (L44 – 46)

„For this purpose, mechanistic models are used, such as the USEPA's Storm Water Management Model (SWMM), which account for surface runoff, drainage of the sewage network, and flooding of stormwater during system overload (Guo et al. 2021; Li et al. 2022; Yang et al., 2022; Lama et al. 2021b)." (L52 – 54)

„Moreover, there are a strong interactions between the calibrated parameters (Wu et al. 2013; Chen et al. 2018; Sonavane et al. 2020; Shrestha et al., 2022; Ray et al. 2023), *leading to uncertainty of simulation results (Ball 2020; Kobarfard et al. 2022; Sun et al. 2022) which complicates to select specified corrective action (Kim et al. 2017; Bobovic et al. 2018; Hung and Hobbs 2018)."* (L 59 – 62)

„To overcome the limitations of MCM, the implementation of statistical and/or machine learning methods seems is a prospective alternative (Rosenzweig et al. 2021; Lei et al. 2021; Bui et al. 2019; Shafizadeh-Moghadam et al. 2018; Chen et al. 2019; Fong and Chui, 2020; Mohammand et al. 2023)." (L 66 – 68)

3. METHODS: Please, insert a Figure for each sub-section. This could improve considerably the clarity of your manuscript.

Dear Reviewer, we appreciate the comment. We would like to kindly inform you that the option in which each computational scheme was to be included in a subsection was considered, but it led to a significant lengthening of the manuscript. Thus, we ultimately decided that the individual computational components of the model and its subsequent steps would be presented in the computational algorithm. The assumed approach in our the paper is typical of the field literature, as evidenced by exemplary publications:

1. Jato-Espino, D., Sillanpää, N., Andrés Doménech, I., Rodríguez-Hernández, J. Flood risk assessment in urban catchments using multiple regression analysis. J. Water Resour. Plann. Manag. 144, 04017085 (2018). https://doi.org/10.1061/(ASCE) WR.1943-5452.0000874.

2. Mayra, R., Fu, G., and Butler, D., Yuan, Z., Cook, L. Global Resilience Analysis of Combined Sewer Systems Under Continuous Hydrologic Simulation. J Environ Manage 344, 118607 (2023). http: //doi.org/10.2139/ssrn.4416250

3. Jato-Espino, D., Indacoechea-Vega, I., Gáspár, L., Castro – Fresno, D. Decision support model for the selection of asphalt wearing courses in highly trafficked roads. Soft Comput 22, 7407–7421 (2018). https://doi.org/10.1007/s00500-018-3136-7

4. Jato-Espino, D., Martín-Rodríguez, Á., Martínez-Corral, A., Sañudo-Fontaneda, L. A. Multi-expert multi-criteria decision analysis model to support the conservation of paramount elements in industrial facilities. Herit Sci 10, 68 (2022). https://doi.org/10.1186/s40494-022-00712-7

5. Casal-Campos, A., Sadr, S.M.K., Fu, G., Butler, D. Reliable, resilient and sustainable urban drainage systems: an analysis of robustness under deep uncertainty. Environ. Sci. Technol. 52, 9008 (2018). https://doi.org/10.1021/acs. est.8b01193. –9021