Universität Siegen

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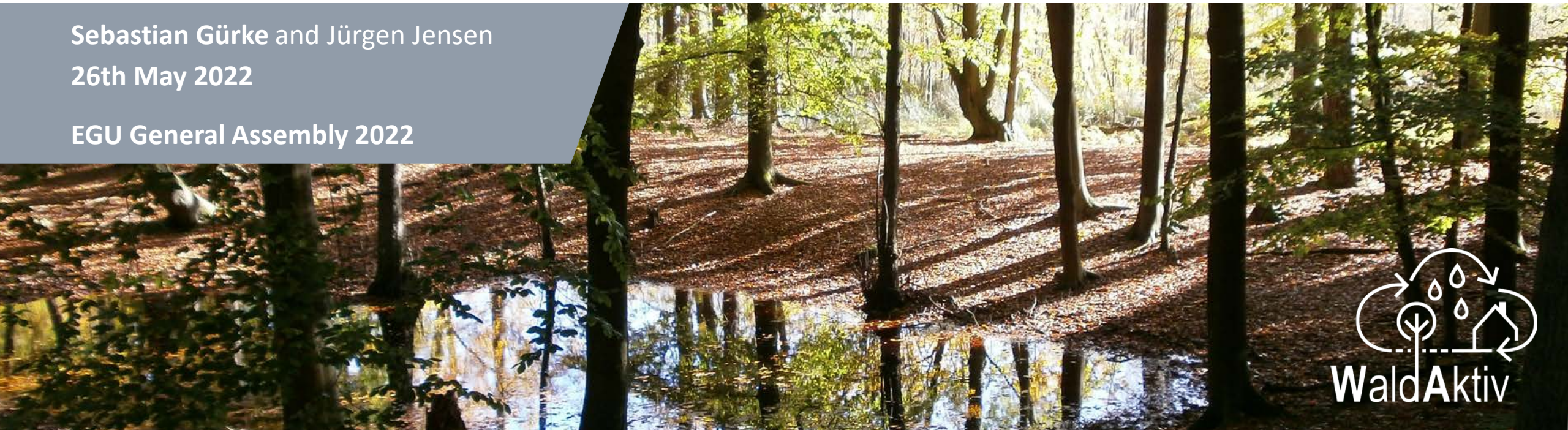
Studies on the active use of urban forest areas as pluvial flood prevention

Research Institute for Water and Environment
fwu

Sebastian Gürke and Jürgen Jensen

26th May 2022

EGU General Assembly 2022



Introduction & Objective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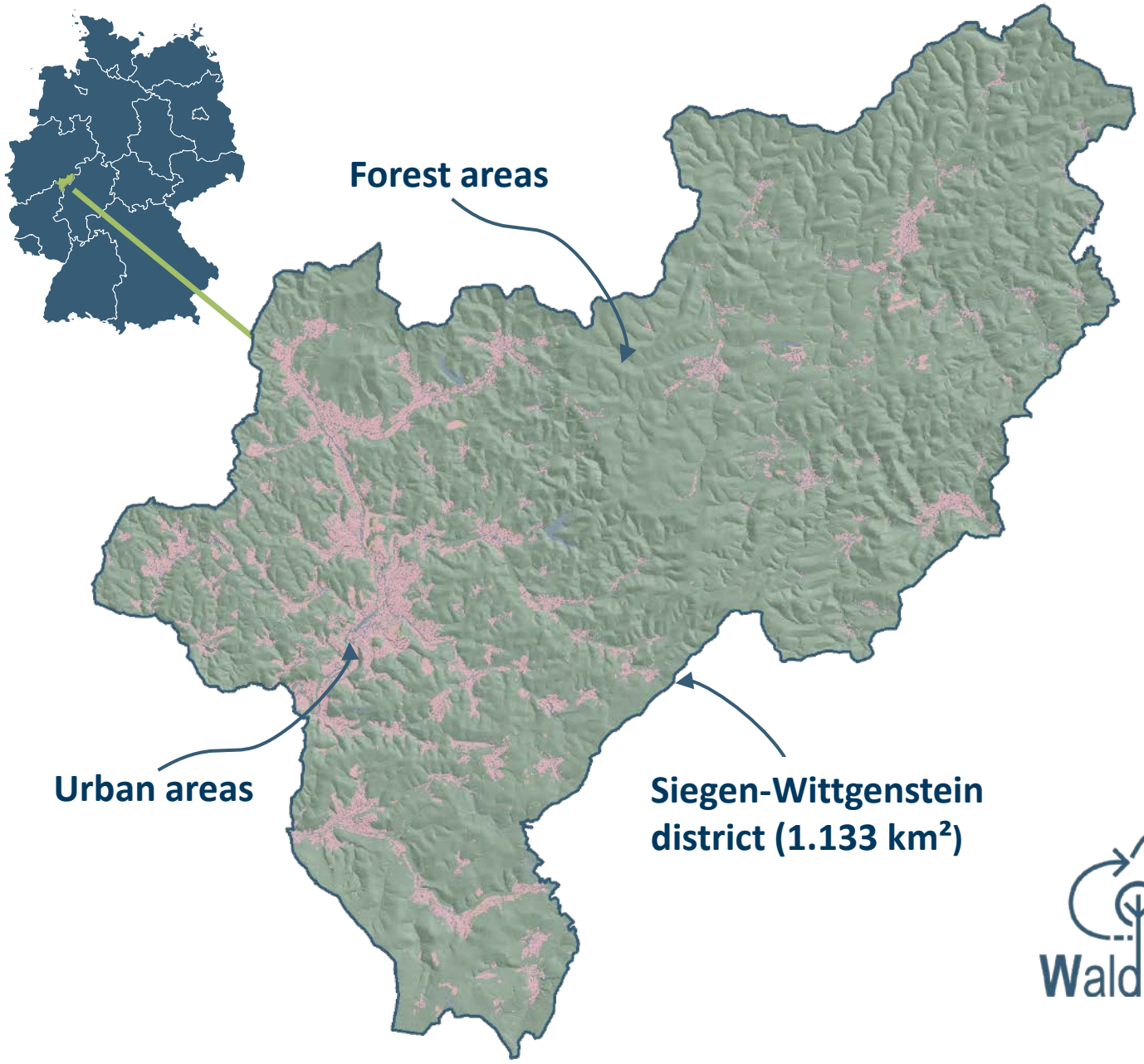
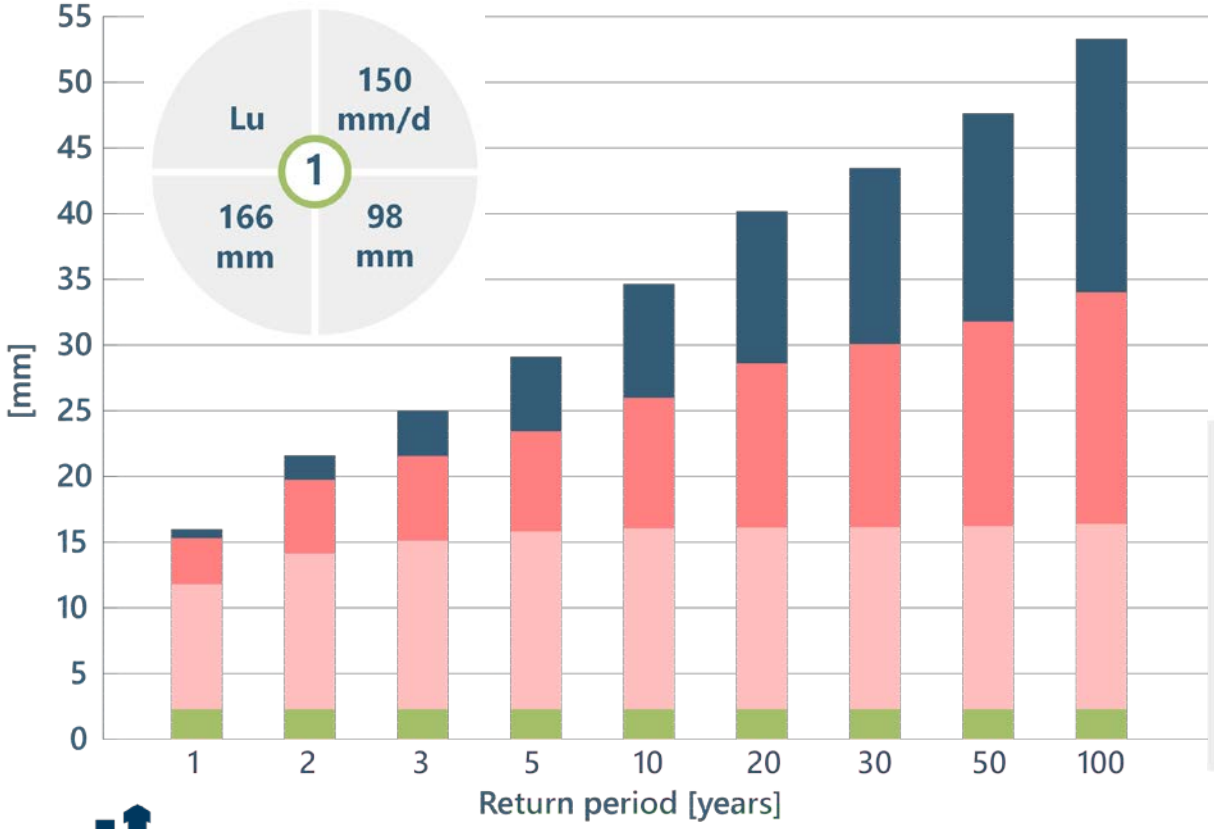
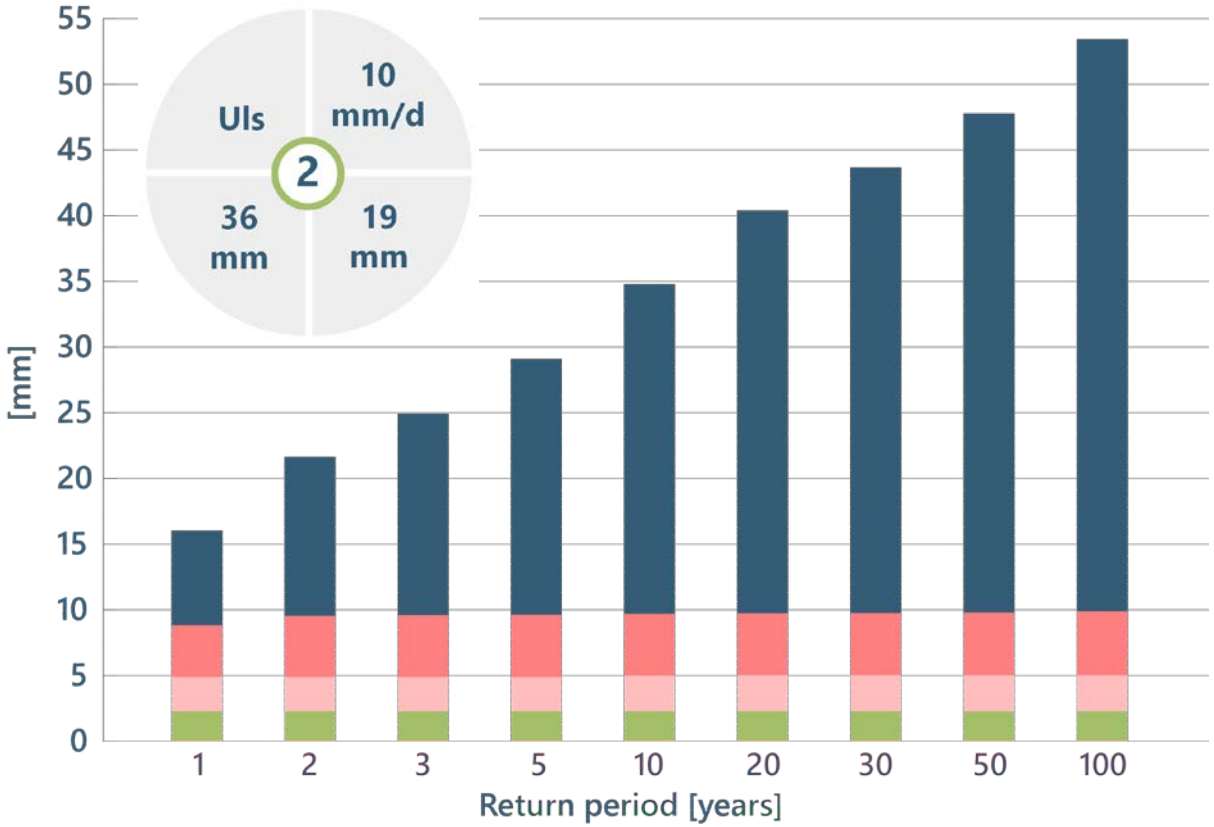


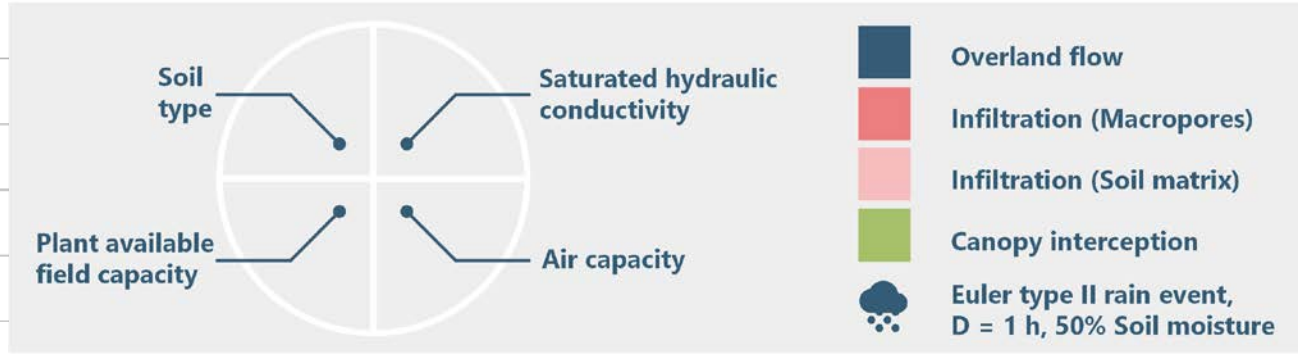
WaldAktiv

Hydrological modelling

Soil hydrological model »RoGeR« (Steinbrich et al., 2016)

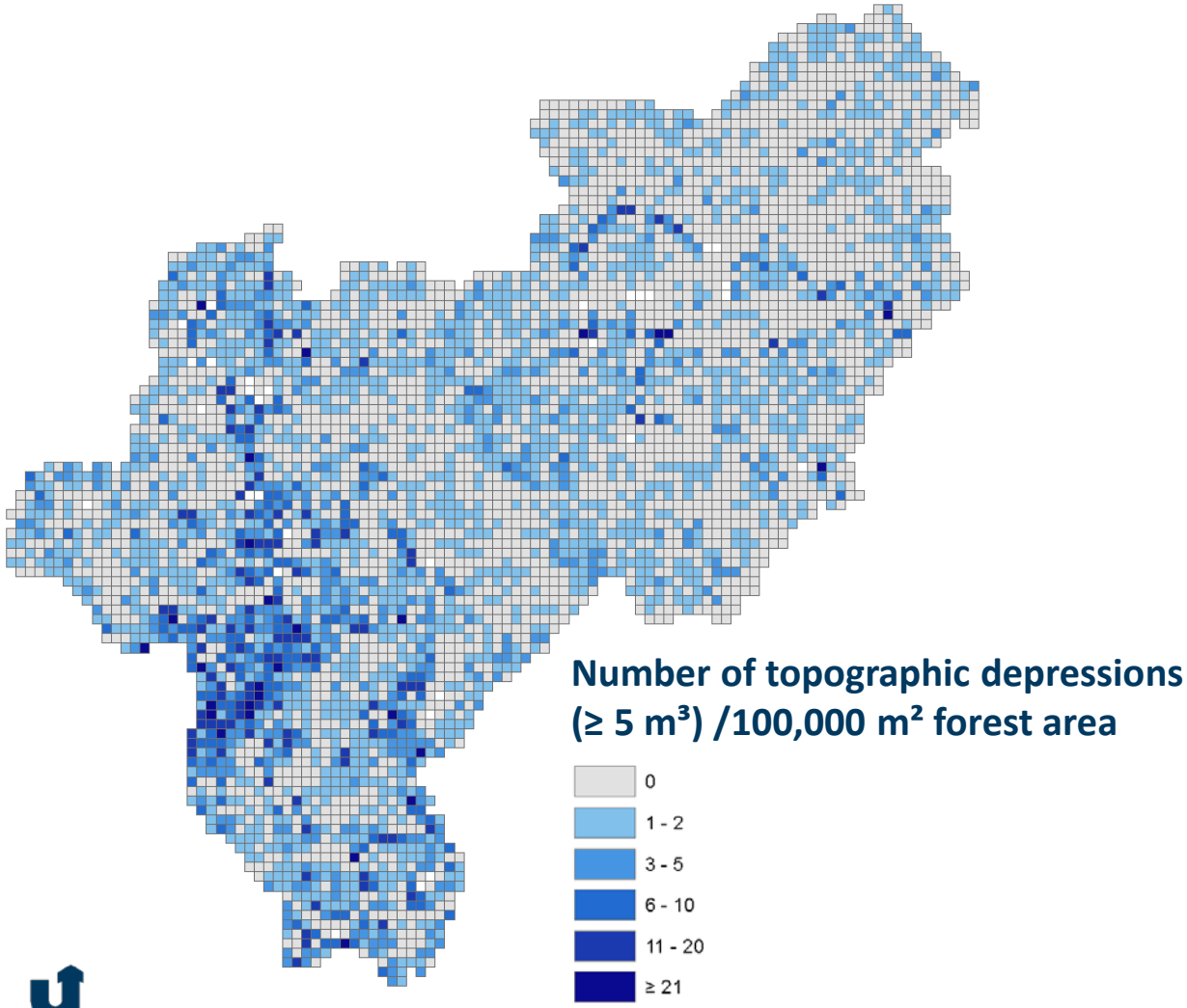






Topographic analysis

Matlab based »TopoToolbox« (Schwanghart & Scherler, 2014)



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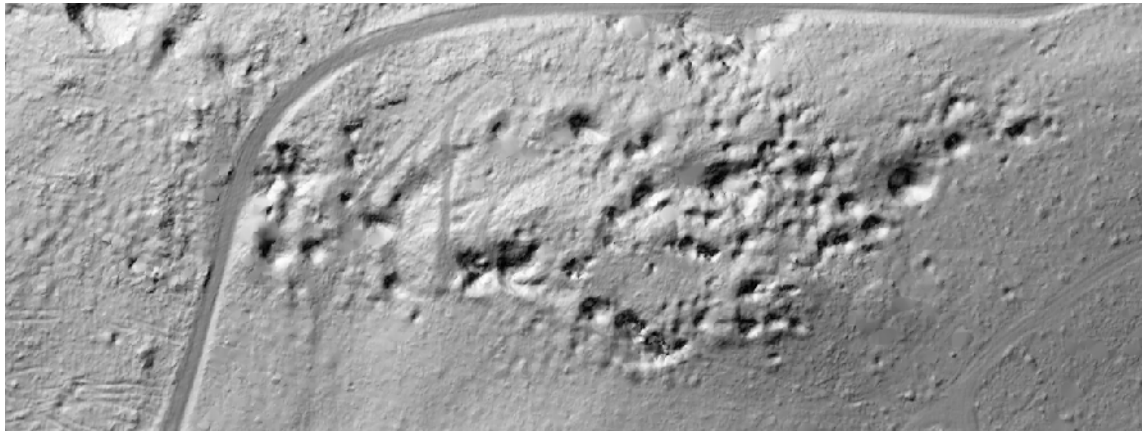

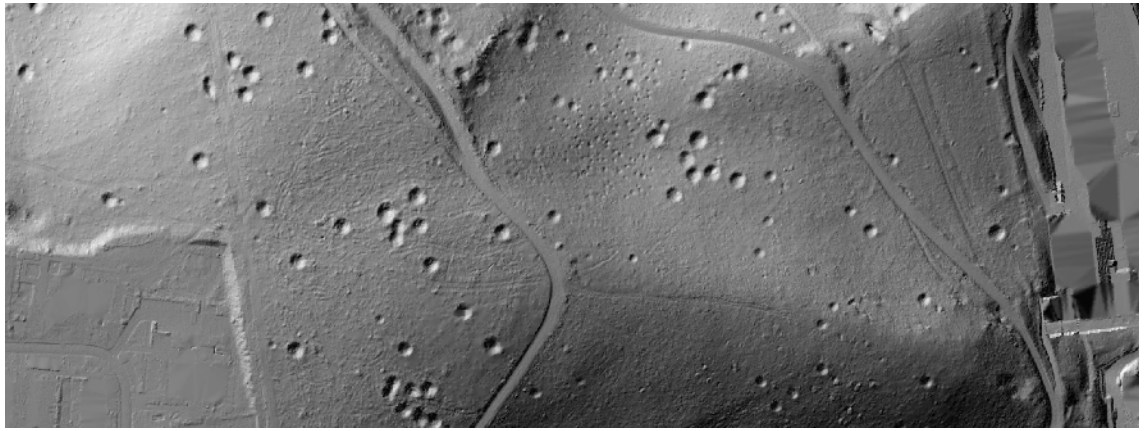

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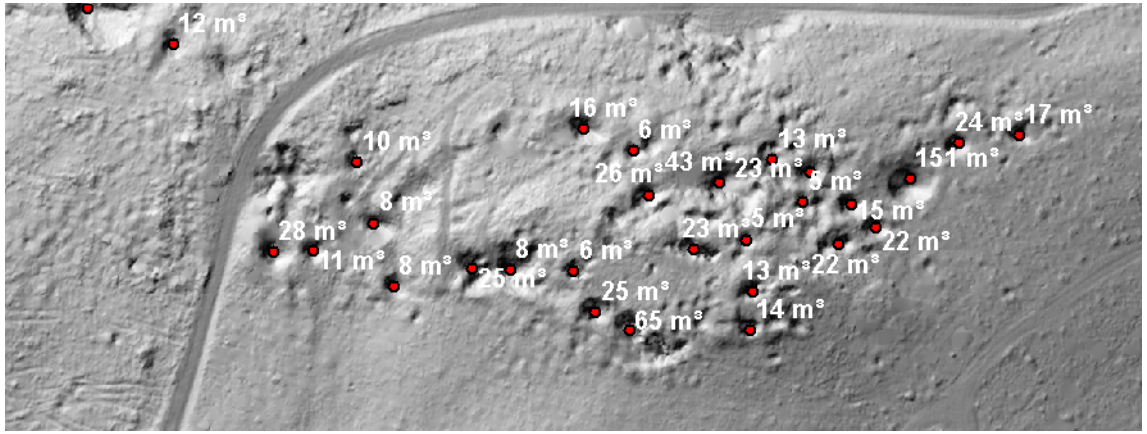

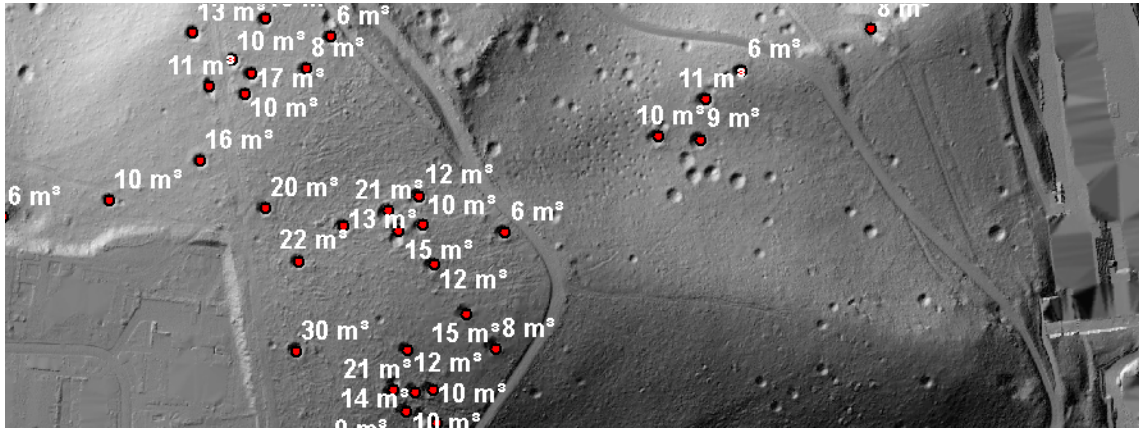

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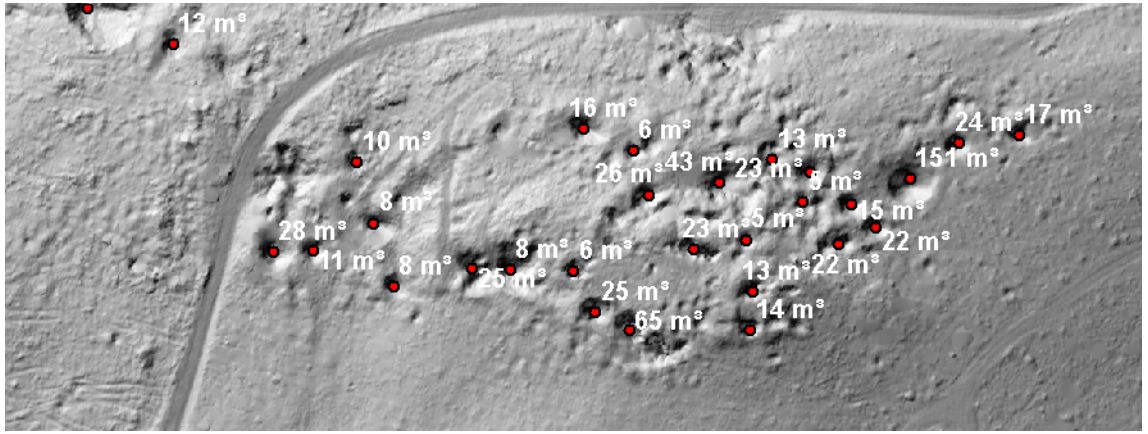
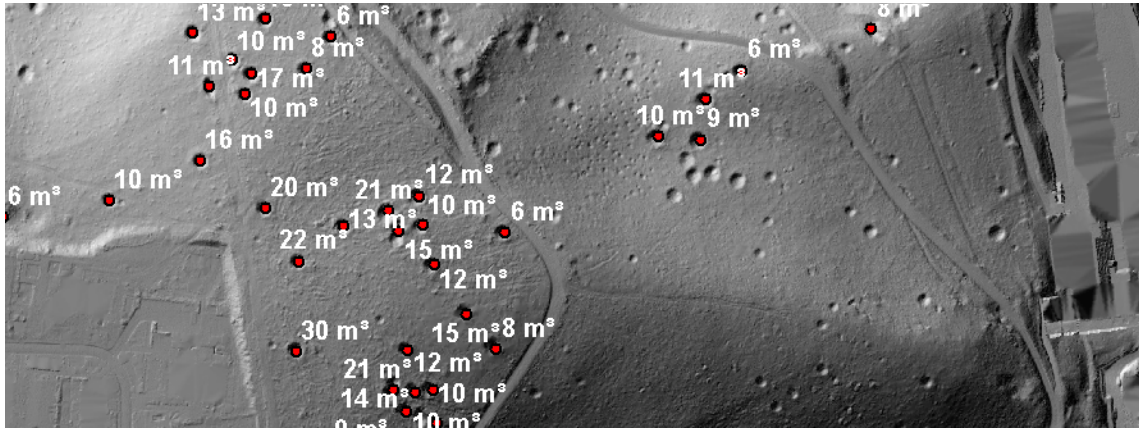
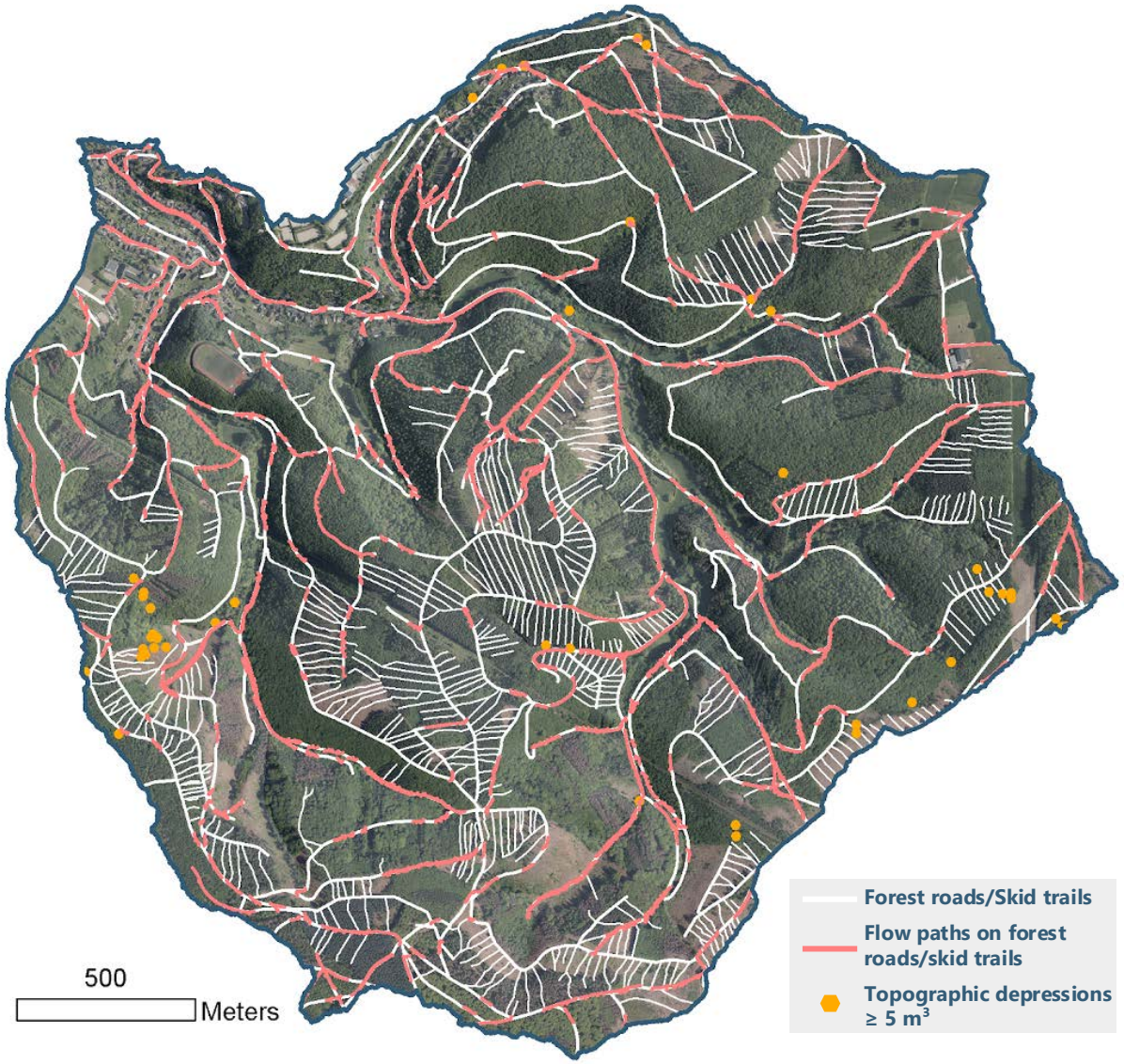




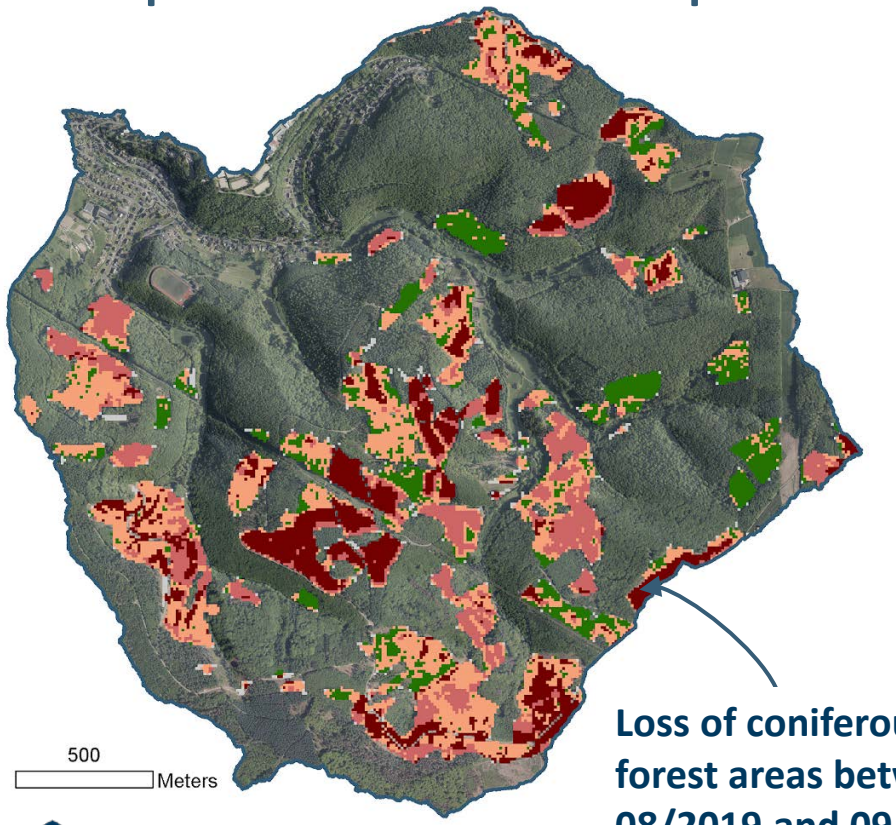


Take-home messages

1.) **Forest areas** should be considered as **important elements of flood prevention** and **protected** accordingly

2.) The current situation with the loss of forest should be used to **improve water retention**

3.) The **retention capacity** of forests as the **sum of interception, infiltration and retention in terrain depressions should be compensated** locally



Loss of coniferous forest areas between 08/2019 and 09/2021

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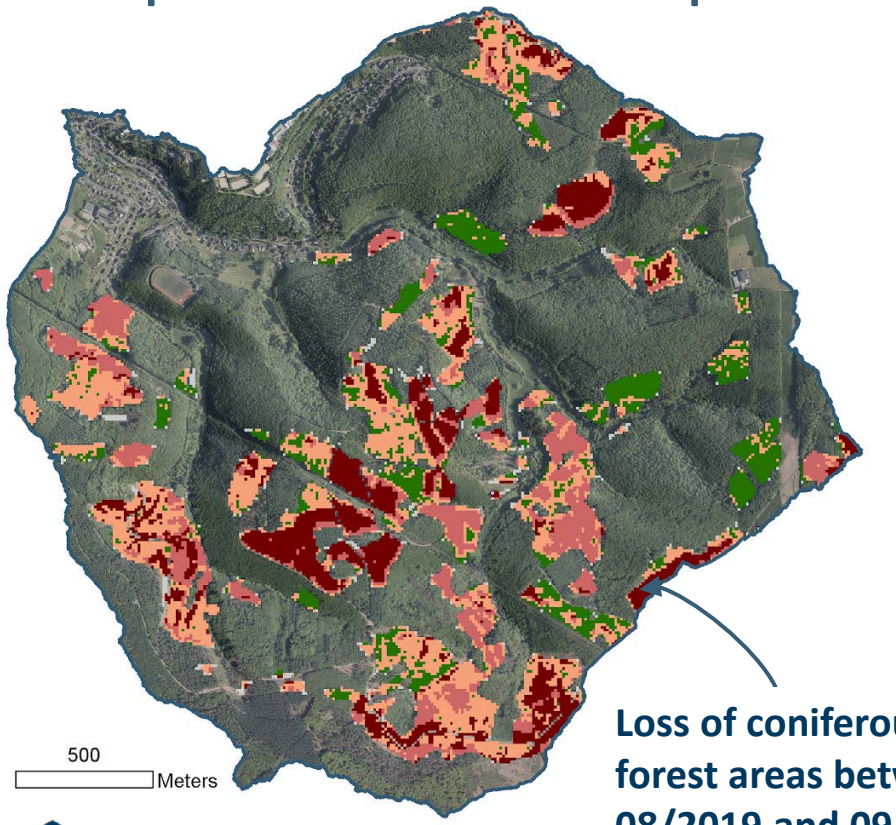

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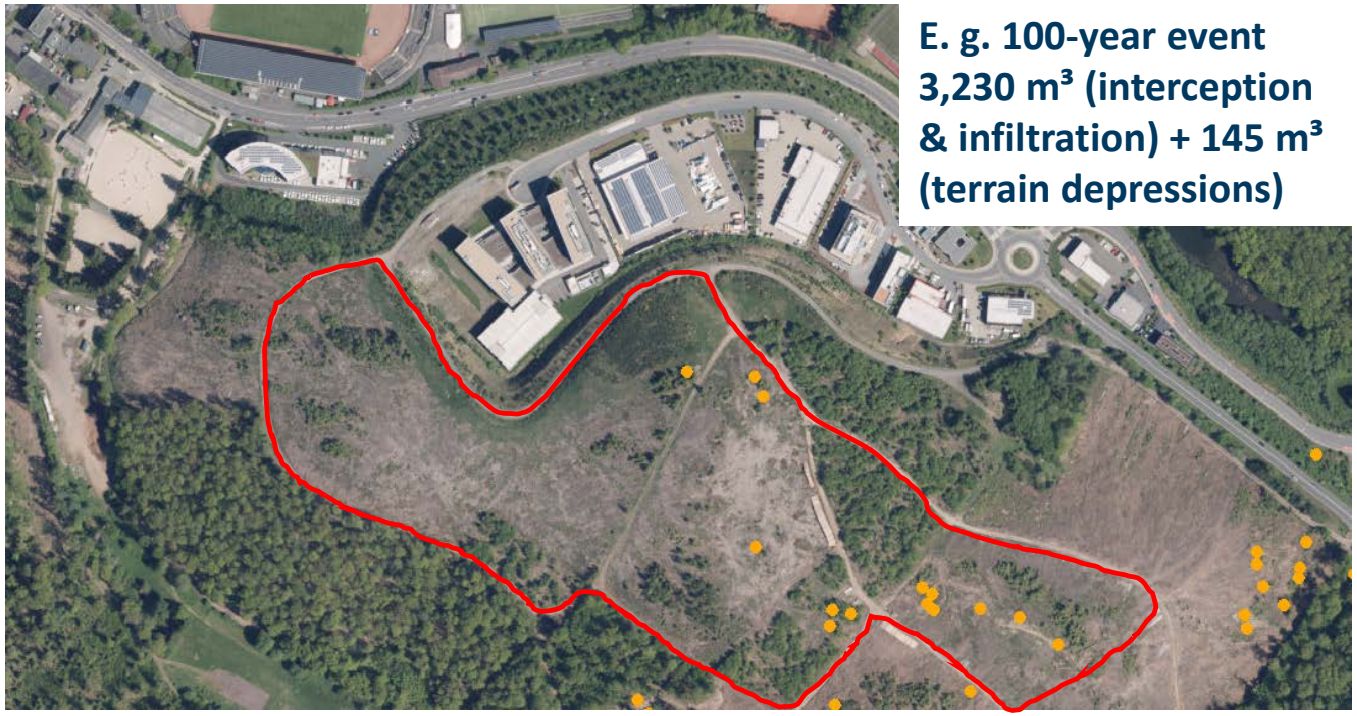

E. g. 100-year event 3,230 m³ (interception & infiltration) + 145 m³ (terrain depressions)

References

Schwanghart, W., Scherler, D. (2014): TopoToolbox 2 - MATLAB-based software for topographic analysis and modeling in Earth surface sciences. In: Earth Surface Dynamics. 2, 1-7, doi: 10.5194/esurf-2-1-2014

Steinbrich, A., Leistert, H., Weiler, M. (2016): Model-based quantification of runoff generation processes at high spatial and temporal resolution. Environmental Earth Sciences (2016) 75:1423, doi: 10.1007/s12665-016-6234-9

wirSiegen.de (2012): „Unwetter: 12 Wohnhäuser überflutet - Feuerwehr im Dauerstress“, 29.06.2012, https://wirsiegen.de/2012/06/unwetter-feuerwehr-im-dauerstress/37244/

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Siegen-Wittgenstein in Südwestfalen

Abstract

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