

Sponge Measures in Agricultural Landscapes: Results from Implementing Nature-based Solutions in the Upper Thames Catchment, UK

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Abstract

Floods and droughts pose significant threats to both human communities and natural landscapes. The EU Horizon SpongeScapes project (www.spongescapes.eu 2023-2027) aims to enhance landscape resilience against these hydrometeorological extremes by exploring "landscape sponge functions" – the natural ability of landscapes to absorb, store, and gradually release water. This project investigates various nature-based solutions (NBS) across diverse European sites with varying climates, geographies, and soil conditions, to address three main questions: (i) what is the longer-term effectiveness of sponge measures (and what indicators/metrics are more adequate); (ii) what is the overall effect of all sponge measures in a catchment (i.e. sponge strategies); (iii) what are the main co-benefits and tradeoffs of sponge measures and strategies. Here we will present results from implementing Sponge Measures in agricultural fields water retention capacity in the river Thames basin where research has been ongoing since 2017. These sites include several farms where regenerative agricultural practices (RAPs) have been followed to improve soils, surface and ground water resilience to hydro-climatic extremes of floods and droughts. Results will be presented and discussed based on ongoing field investigations, including analyses based on survey data for soil bulk density, water retention functions, infiltration and hydraulic conductivity for the agricultural fields, as well as interrogating longer-term datasets in sites monitored for 10 years or more.

Keywords: sponge, nature-based solutions, regenerative agriculture, floods, droughts