HR Wallingford
Working with water

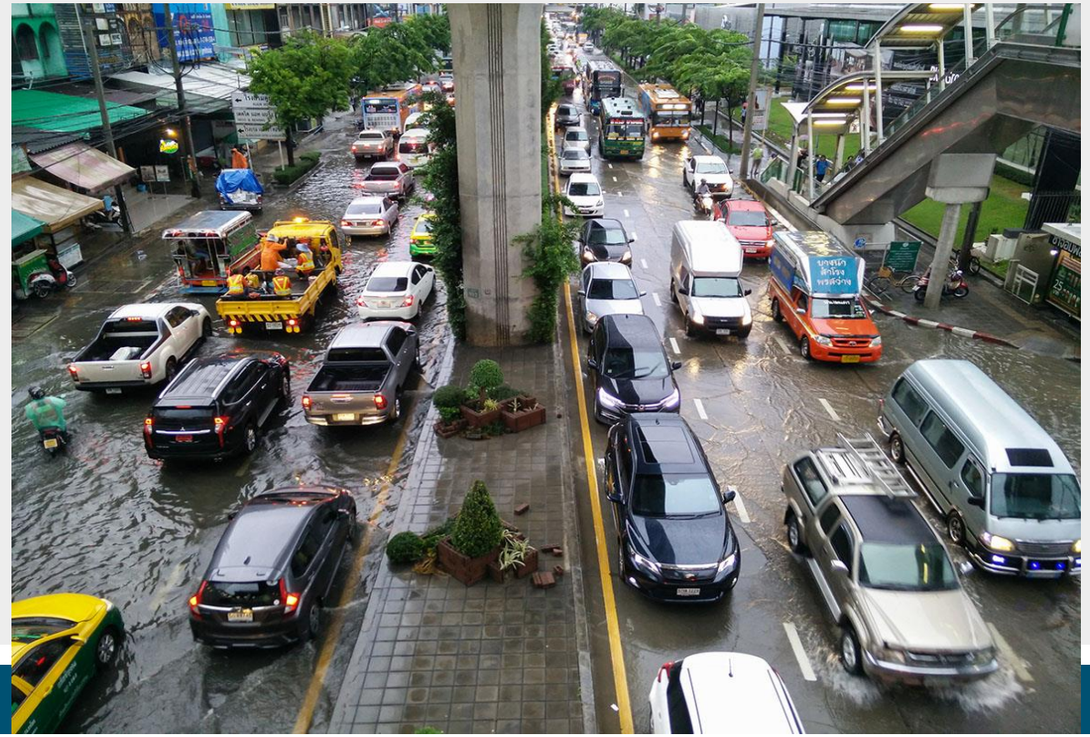
Pillar talk

SuDS & Water Quantity

11 December 2020

Bridget Woods Ballard

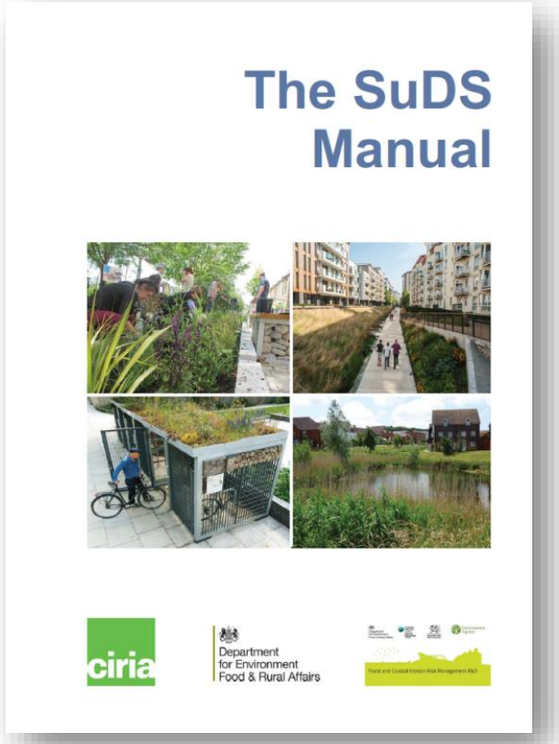
.....Water.....

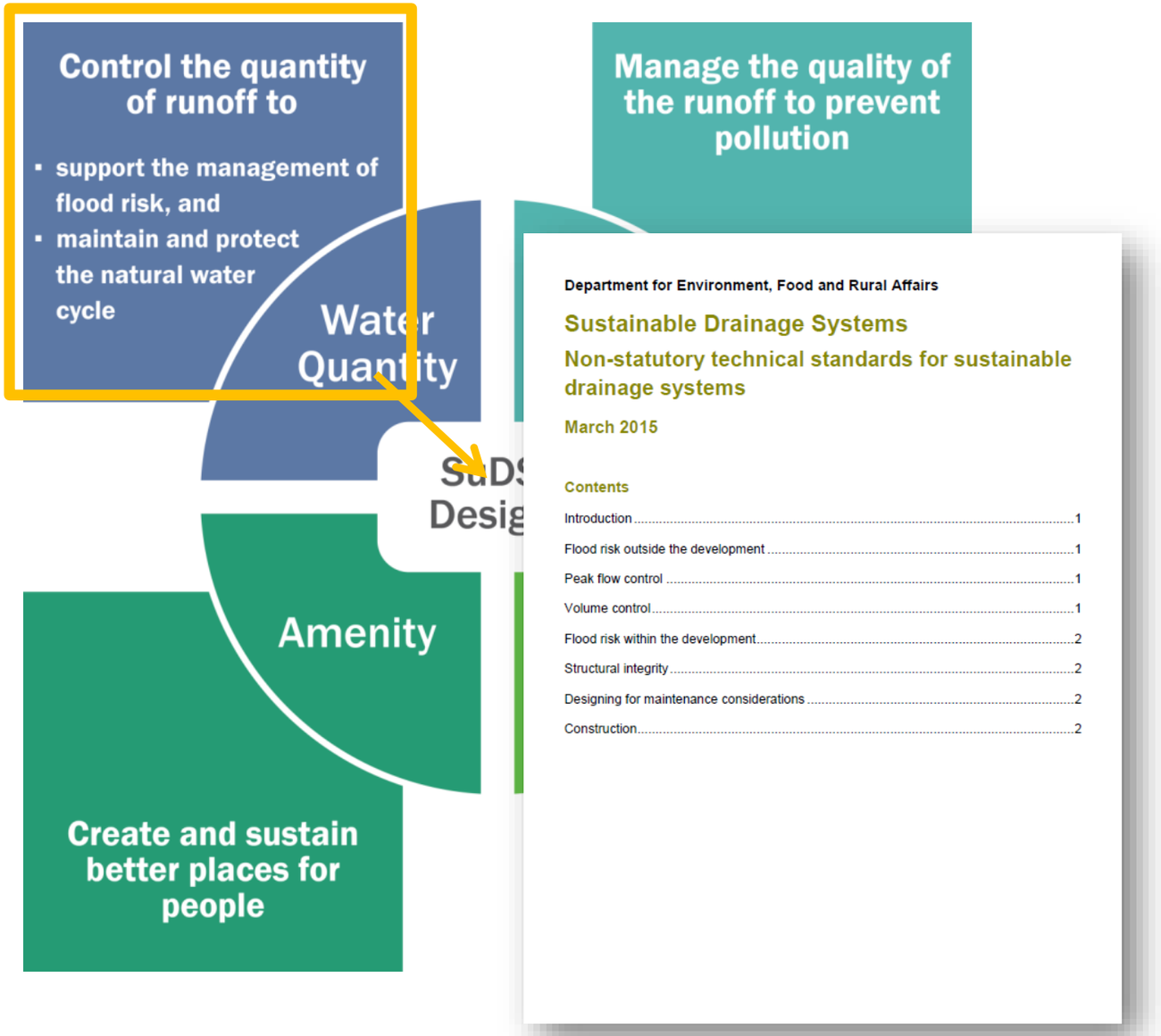


Courtesy Illman Young

The rules..

Surface water runoff should be managed for maximum benefit



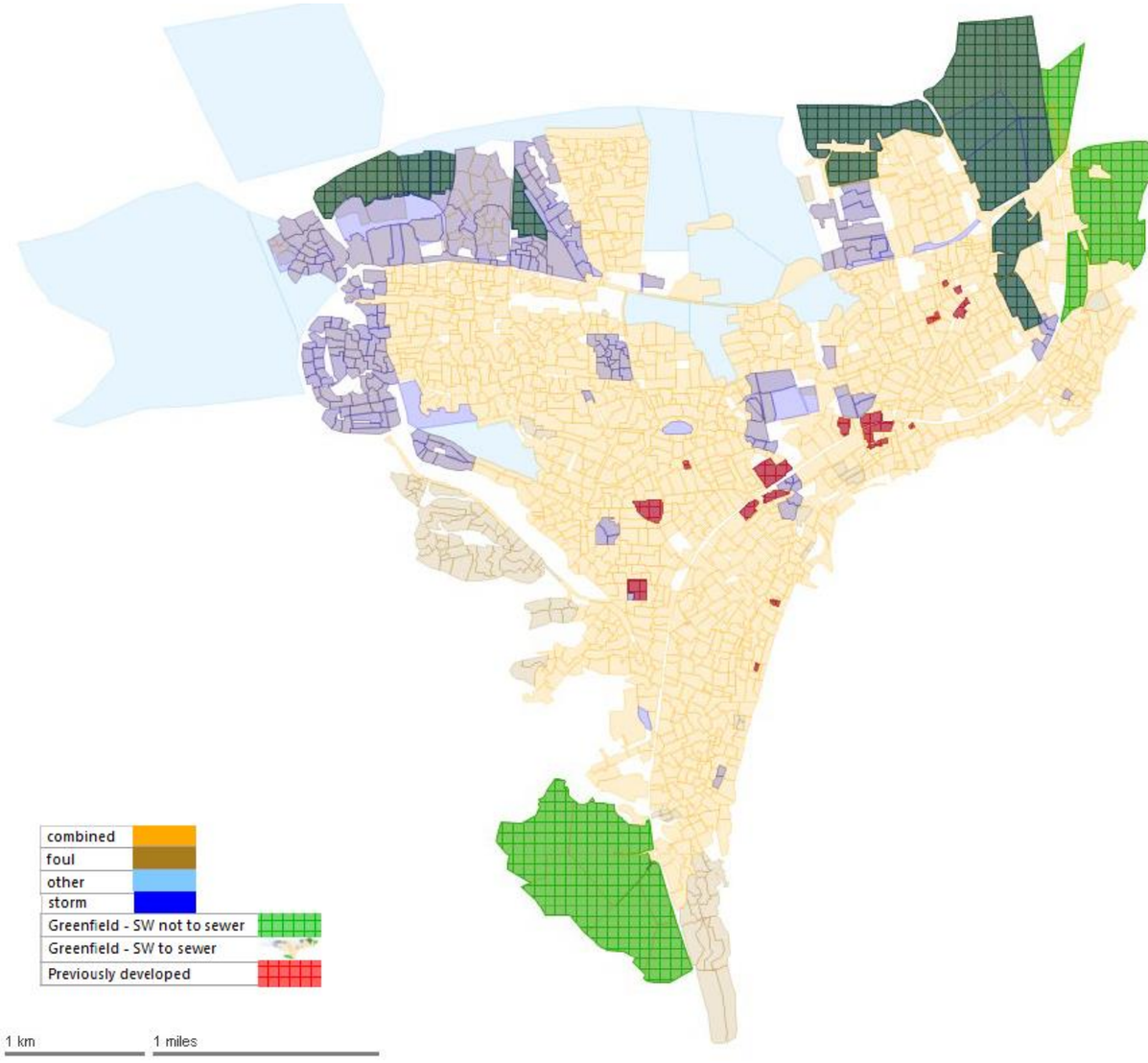


UK rain is going to get heavier

Image Credit : "Rain" by Ben Chapman via Flickr is licensed under CC BY 2.0
December 2, 2019

The United Kingdom will see heavier rainfall according to a new research by led by Dr Markus Rau and Dr Yi He of the Tyndall Centre for Climate Change Research at the University of East Anglia. This is the first analysis of the effect of global warming on hourly rainfall for the UK.

A globally warmed atmosphere holds more moisture. As rising temperatures intensifies the water cycle it increases evaporation, resulting in more storms. The intensity of rainfall depends on how much water the air can hold at a given time. The air can hold up to 7% more moisture for every 1C of temperature rise.



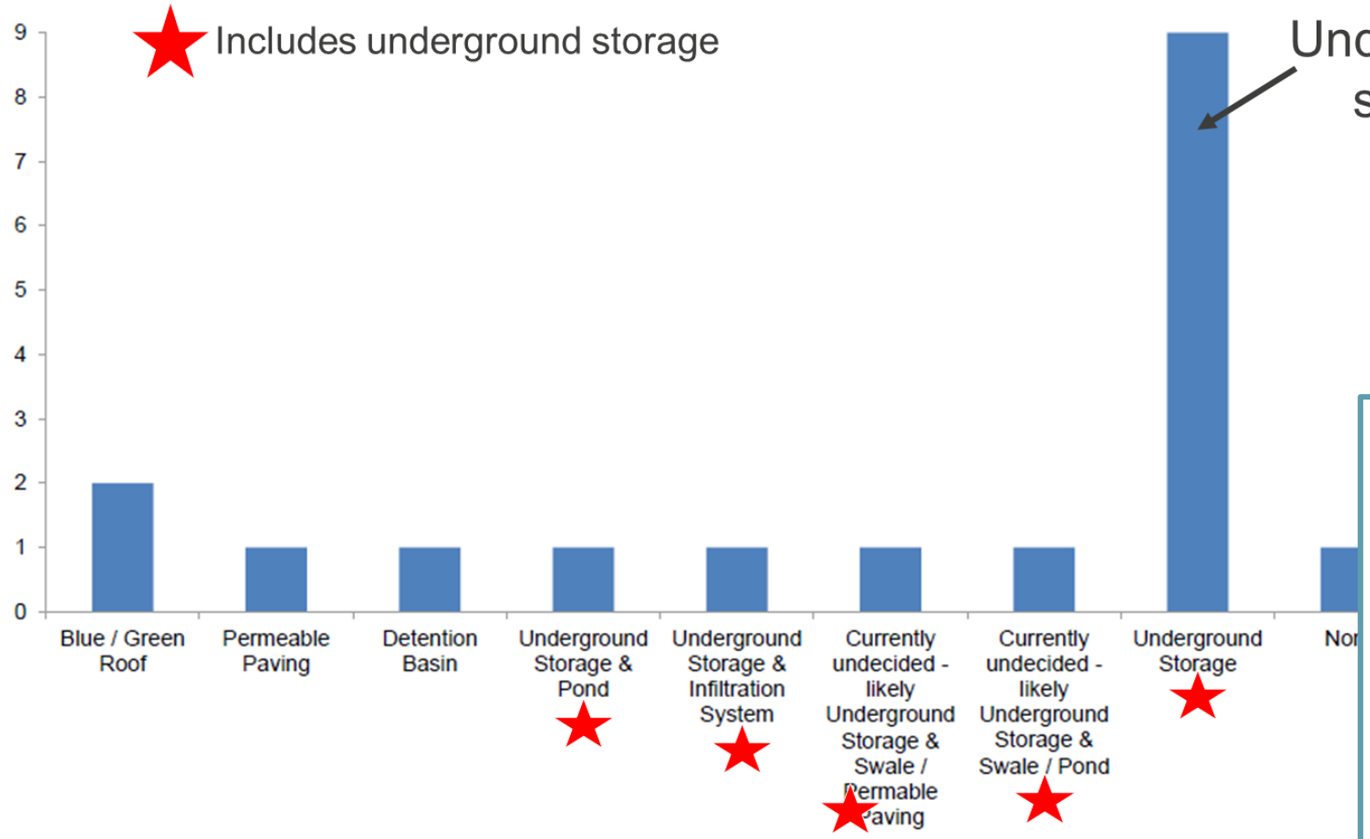


Figure 4.3: Types of storage solutions designed on each development site

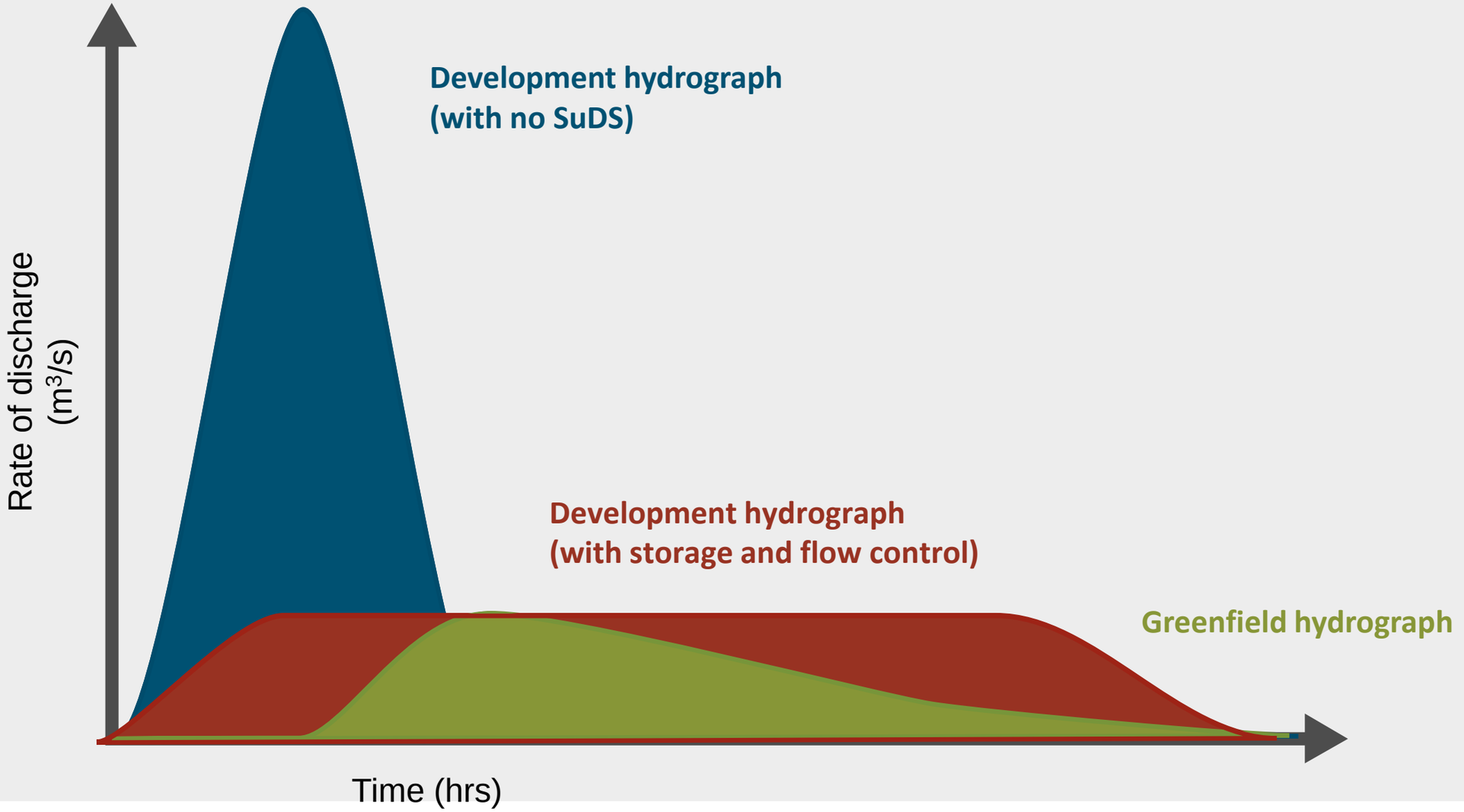
UKWIR, unpublished

- *"a conventionally piped surface water system with attenuation via oversized pipes and a restricted discharge may be defined as sustainable drainage under the current non-statutory guidance"*.
- where higher quality SuDS were aspired to, schemes often adopted pipe-to-pond systems that offer few benefits and can be problematic to manage.
- *"The NSTS are only effective in delivering flood risk management"*.

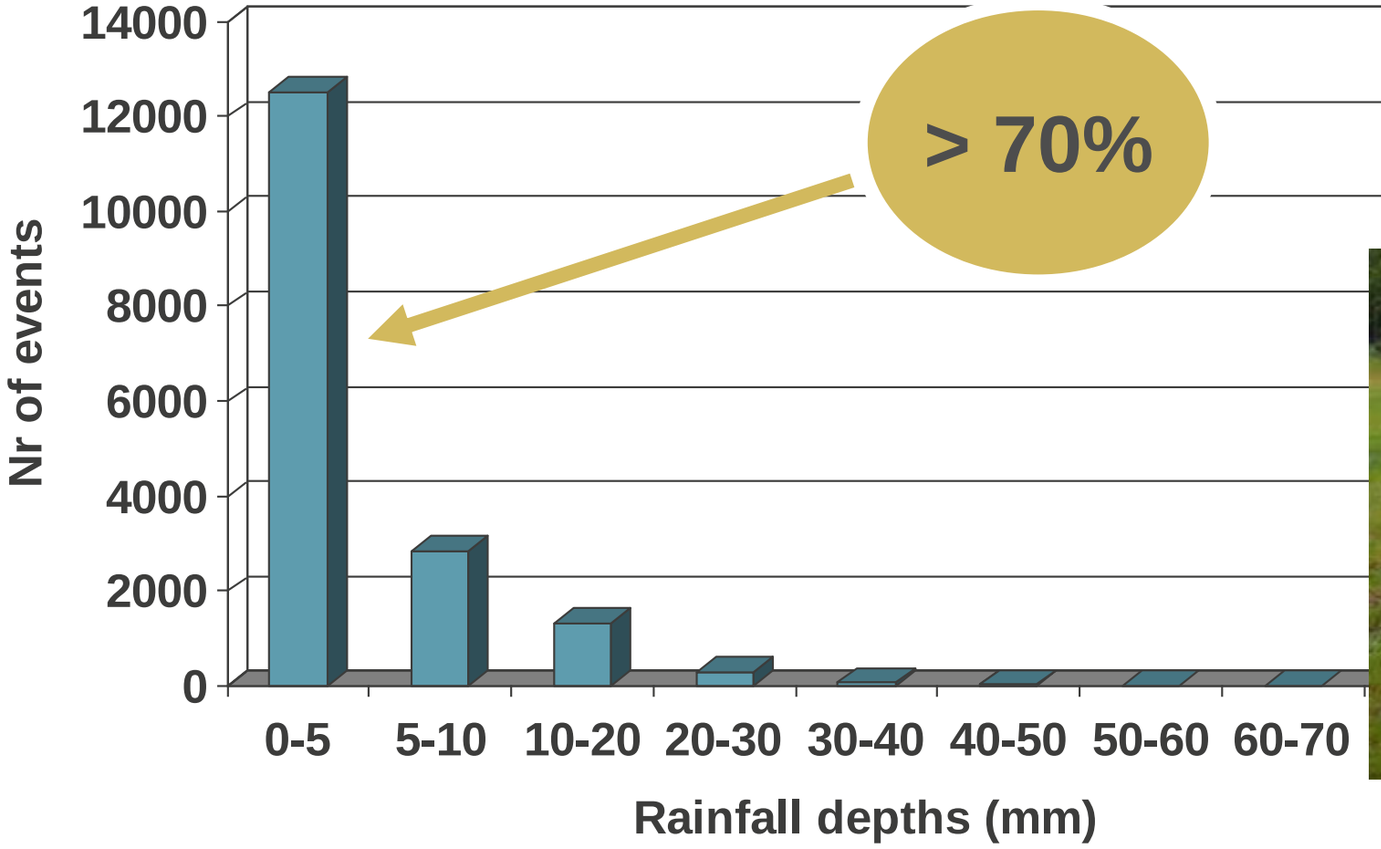
CIWEM (2017)

Jehovah’s Witnesses headquarters (susdrain awards 2020, highly commended)

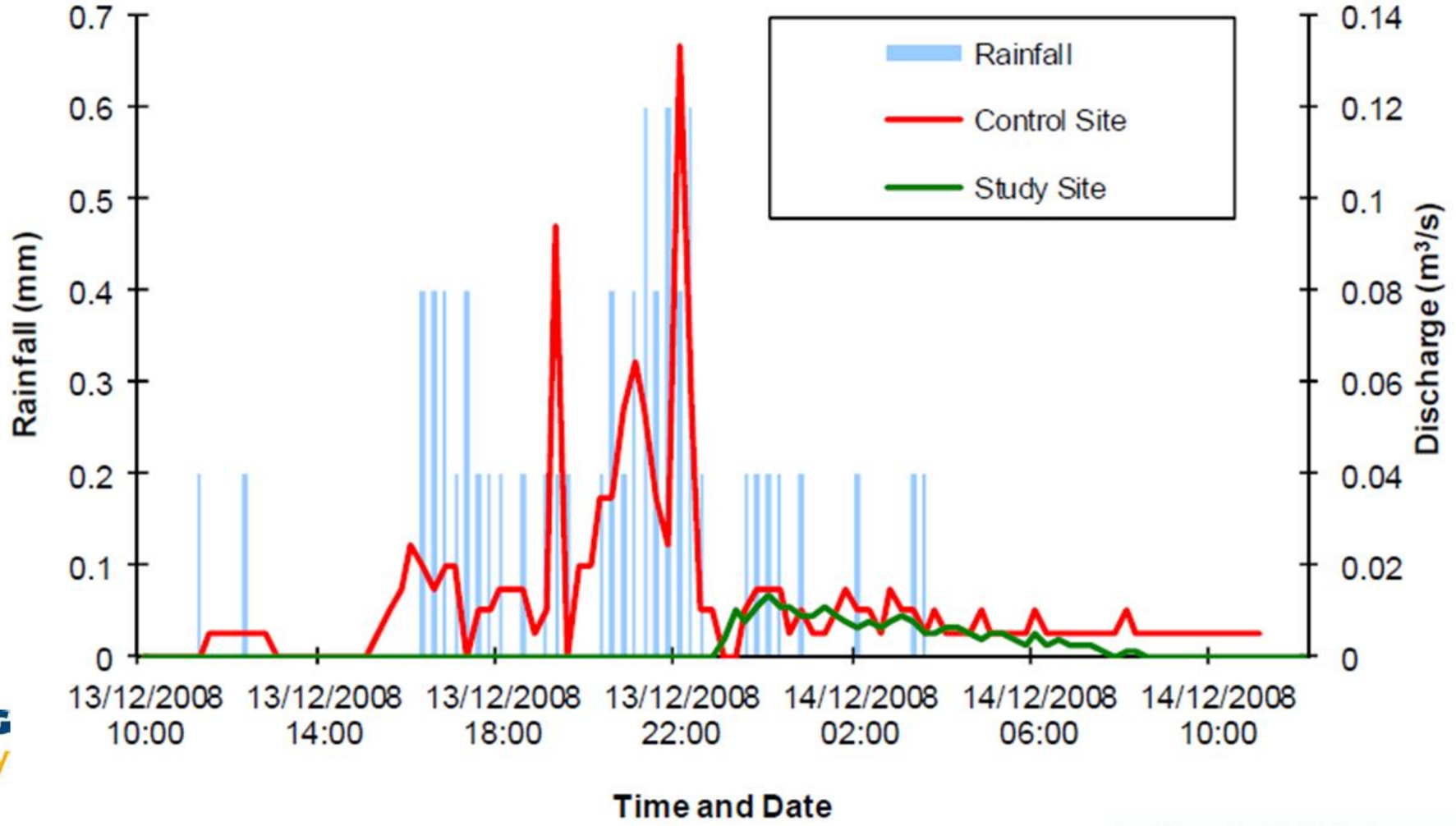
The good and the bad..



Most of our rainfall events are < 5mm

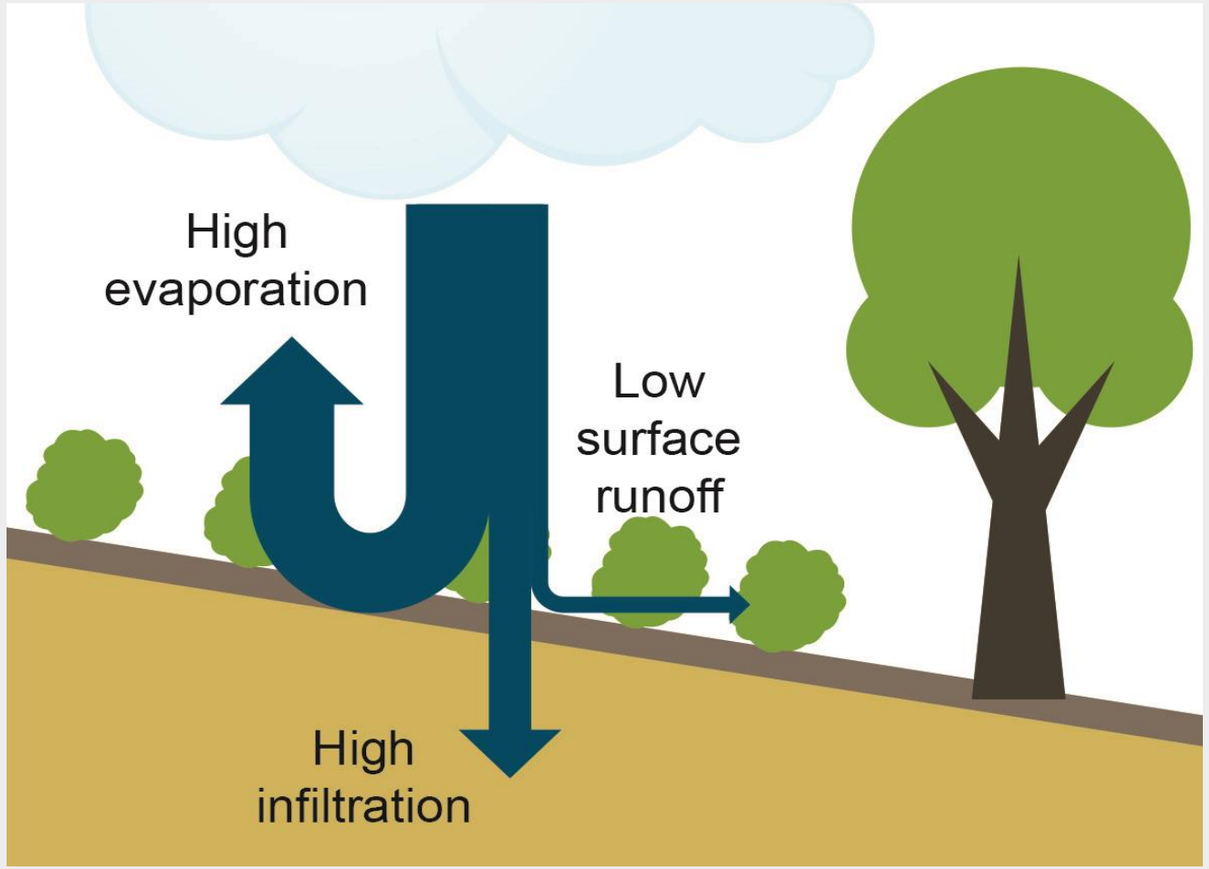


Bill Lord, North Carolina State

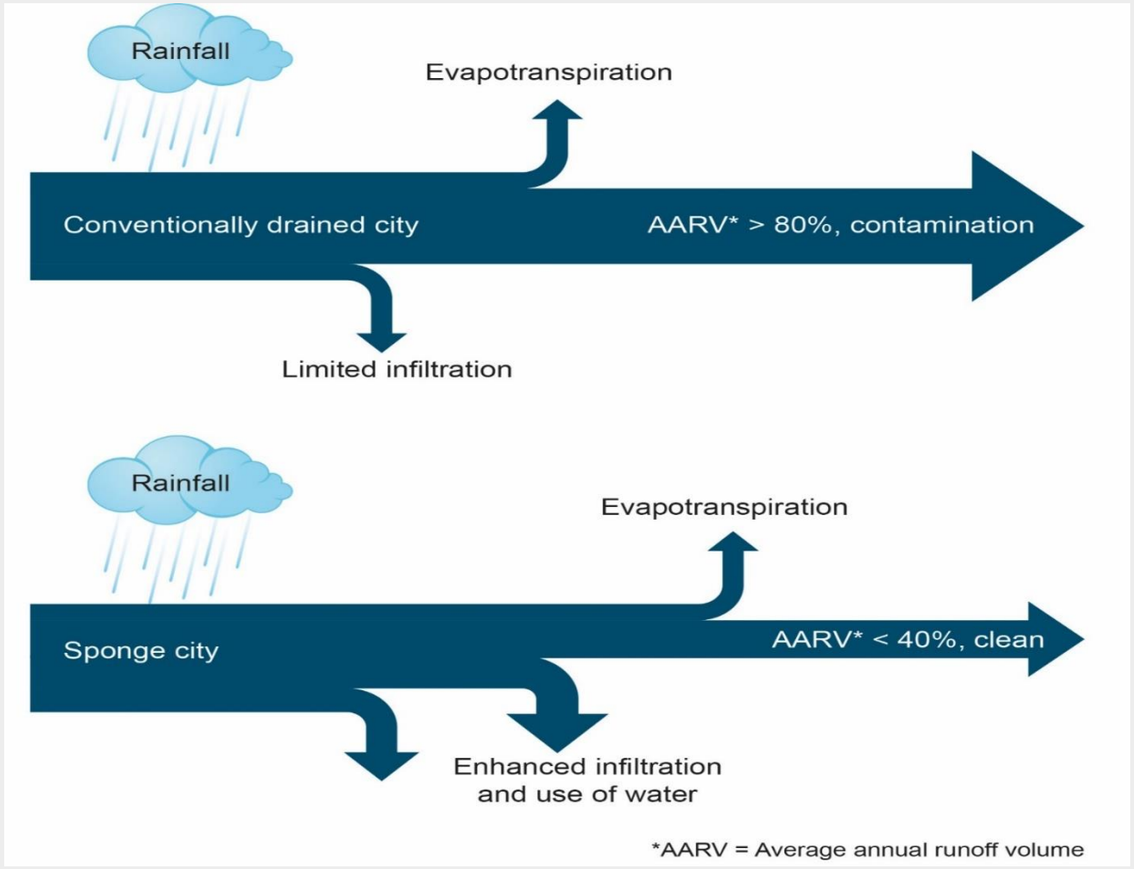


Lamb Drove Sustainable Drainage Showcase Project, Cambourne Village (FLOWS Project)

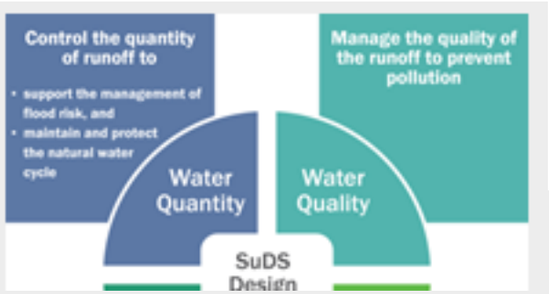
Germany (**Water Sensitive Drainage**)



China (**Sponge Cities**)



SuDS Manual: hydraulic design objectives



Frequent events

- Protect morphology and ecology in receiving waters
- Preserve and protect natural hydrological systems
- Support demand management
- Protect water quality
- Drain the site effectively

Large, extreme events

- Manage flood risk in the receiving catchment
- Manage on-site flood risk
- Provide system flexibility, adaptability and resilience to cope with future change

Bertha Park (susdrain awards 2020, joint winner)

Images in this presentation courtesy of the SuDS Manual, Illman Young, susdrain award winners