

Figure S1: Continuous raster of water depths created using IDW interpolation of discrete observation points.

771 **S2. Handling of wetting and drying of computational cells.**

772 To ensure mass conservation in the presence of drying computational cells, a three-step procedure was used at
773 each time step:

- 774 1. An initial evaluation of the continuity equation is performed, leading to an initial update of the value of water
775 depth in each computational cell.
- 776 2. The algorithm detects and flags the computational cells in which the computed updated value of water depth is
777 negative.
- 778 3. In all cells in which the computed update of water depth is negative, the outflow unit discharge is reduced such
779 that the computed water depth becomes zero (instead of a negative value).
- 780 4. Because these corrections of the unit discharge may induce drying in neighbouring cells, Steps 1 to 3 are
781 repeated iteratively.

Table S1: MAE/RMSE in maximum flood depth prediction (for raster-based evaluation).

	2m	5m	10m
Minimum	1.01/1.21	1.19/1.36	1.45/1.61
Mean	0.69/0.79	0.74/0.95	0.78/1.01
Maximum	0.69/0.89	1.23/1.91	3.15/4.30

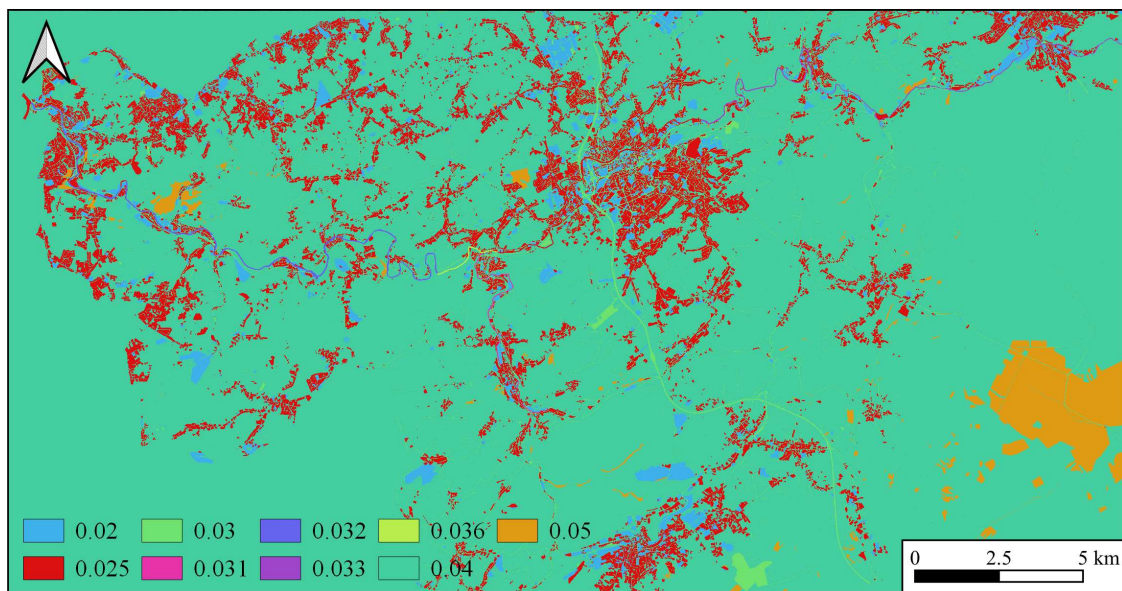


Figure S2: Map of Manning's coefficients derived from land-use data.

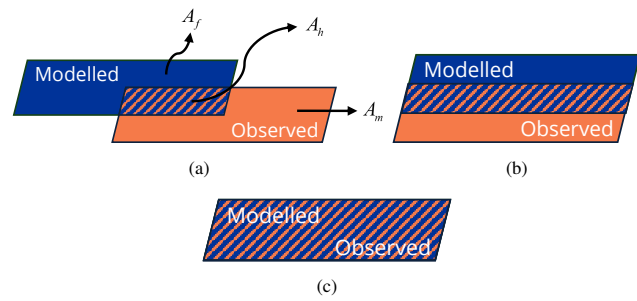


Figure S3: Extent validation based on the critical success index (CSI).

785 CSI values would vary as Figure S3a<S3b<S3c). The CSI ranges from 0 to 1, with a value of 1 (Figure S3c)
786 indicating perfect agreement between the observed and modelled inundation maps in both magnitude and spatial
787 distribution.

788 **S6. Outcomes of nearest neighbour search algorithm**

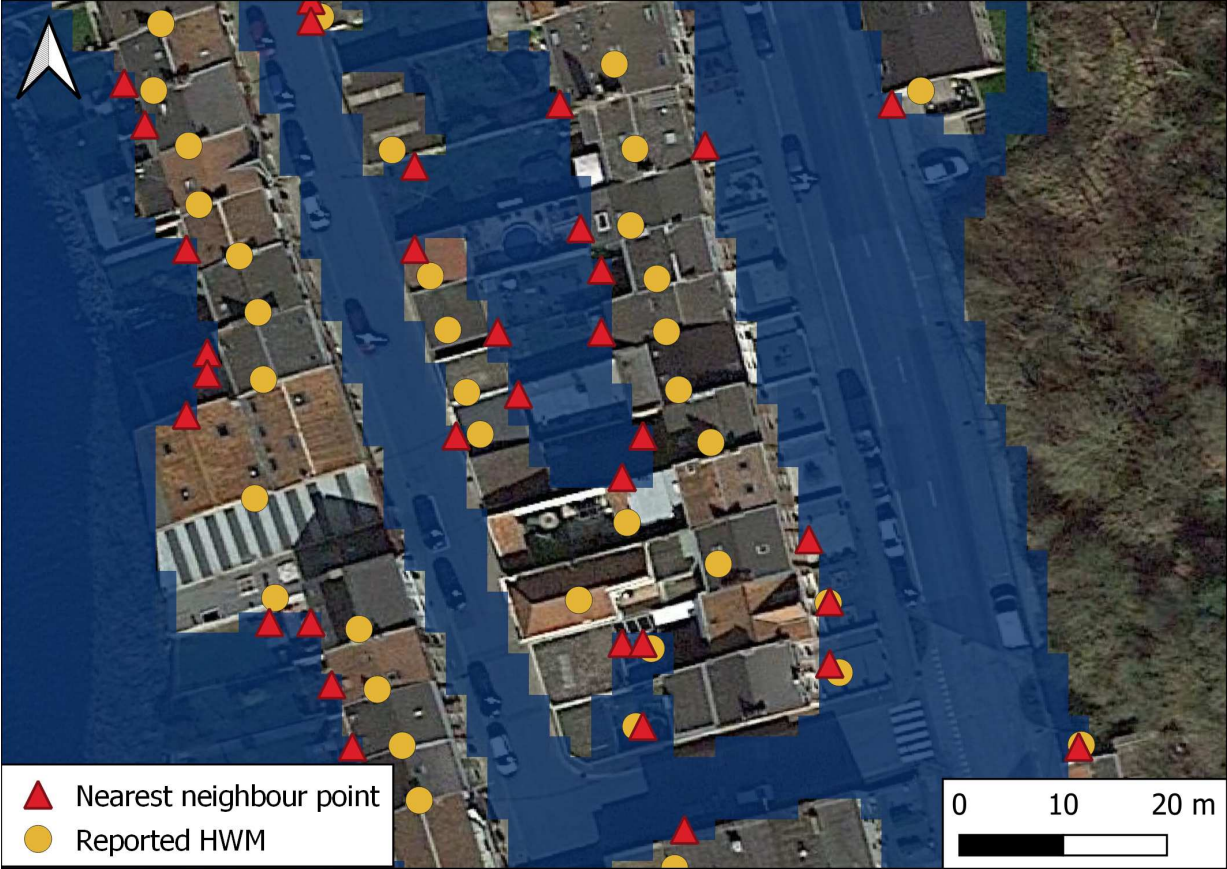


Figure S4: Example outcome of nearest neighbour search algorithm.

789 In case a computed WSE already exists at the location of the reported HWM, the nearest-neighbour search is
790 allocated at the centre of the cell within which the reported HWM is situated.

791 **S7. On overly large buffer sizes**

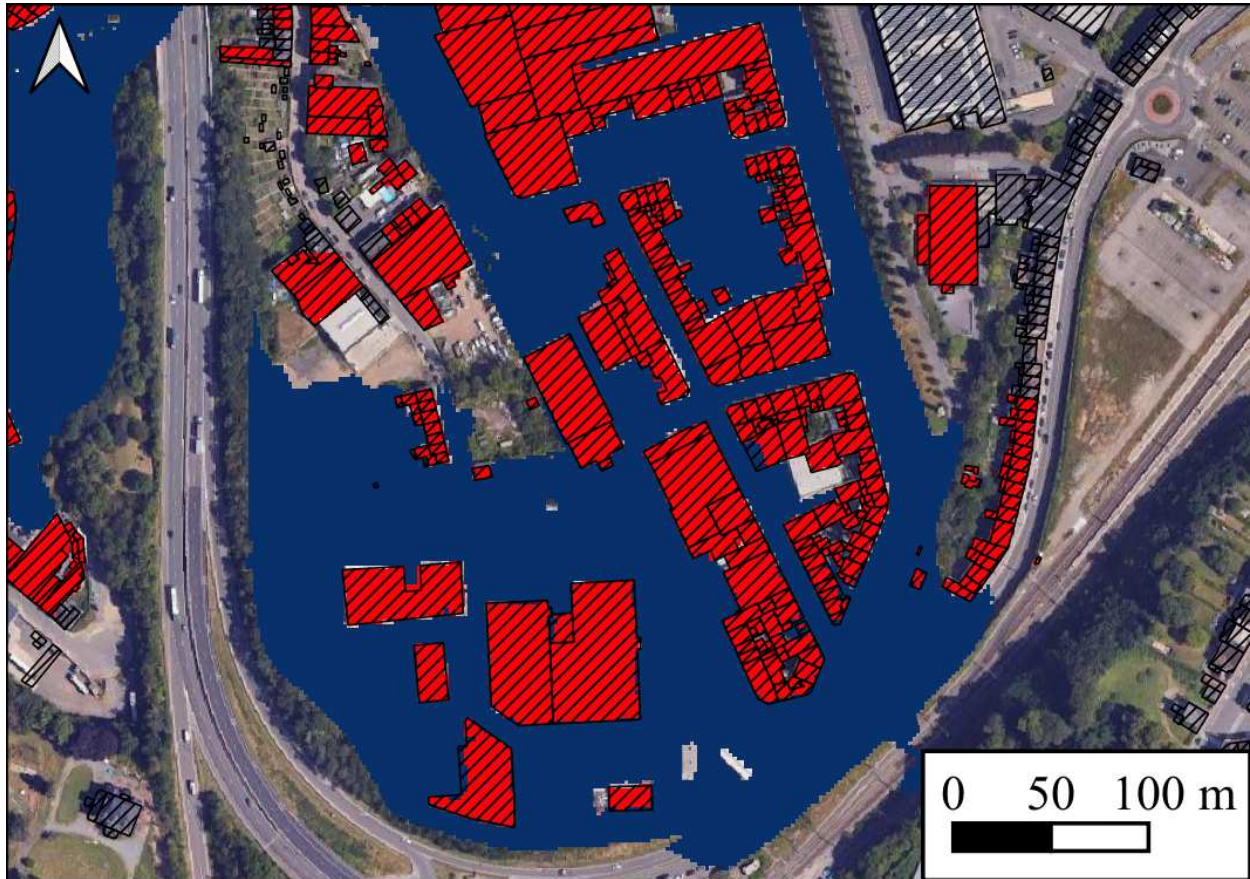


Figure S5: Application of the BB method with buffer size = 30 m. Buildings considered to be inundated are shown in red. Non-inundated buildings are only hatched.

792 In the figure it is found that several buildings which are quite disconnected from the inundation extent are marked
793 as flooded due to the overly large buffer size of 30 m. While the area of such building footprints may be limited and
794 thus may not affect a metric like CSI, they could cause a spike in the total number of inundated buildings.

795
796 A few buildings visible in the background satellite image are found to be missing (not hatched) from the geospatial
797 building dataset. This affects both the BB and IA methods as explained in section 4.2 of the main text.

S8. Comparison of the FoH and TCP methods

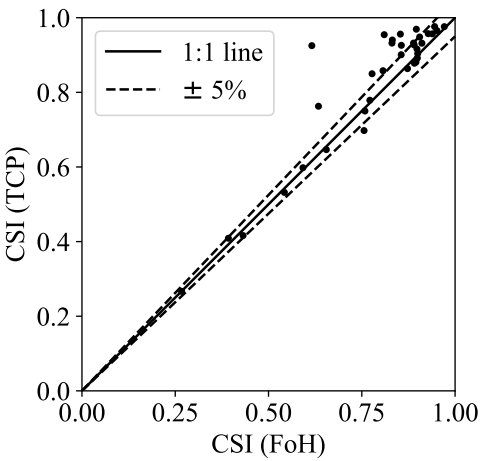


Figure S6: Comparison of sector-wise outcomes of the FoH and TCP methods (for case 2m-mean).