

Table S1. Water permeability classes based on soil and geological characteristics of the drainage basin and the predominant structure type.

Permeability class	Ground features	Geological or hydrolithological characteristics	Structure features
Very High	Very light and well drained soils	Strongly karstified carbonate formations, extensive development e.g. fractured limestones, dolomites, marbles	
High	Sandy and gravelly soils, with a small percentage of silt and clay	Fluvial deposits, inconsistent conglomerates, breccia triadic	Very small settlements
Moderate	Thick sandy soils, silts and silty soils, sandy clay	Granular alluvial deposits, schists, cohesive conglomerates, platy or fine grained limestone alternating with schist formations	Sparsely built areas, significant garden development, urban parks
Low	Fine clay soils, soils from clay, soils poor in organic material	Flysch, metamorphic, plutonic and volcanic rocks, granular non-alluvial deposits (alternating sands, marls, clays, conglomerates, marly limestones, sandstones), granular molasse deposits	Moderately built areas with lawns and small gardens
Very Low	Shallow soils that swell when wetted, plastic clays	Compact rock of negligible permeability (granites)	Shopping centers, densely built areas

Table S2. Vegetation classes based on land use/cover characteristics

Vegetation class	Land use/cover characteristics
Dense	Forests (conifers, broadleaf)
Moderate	Transitional forests, orchards, olive groves, riparian vegetation
Low	Pastures, crops, vineyards, grassland, scrub
Sparse	Fallow land, non-irrigated arable land, dunes, wetlands, scattered construction
Zero	Bare or rocky soil, artificial surfaces (roads, buildings)

Table S3. Drainage capacity classes based on the average slope and related ground features

Drainage capacity class	Average slope*	Other features
Negligible	0 %	Inadequate drainage system, frequent and extensive bedsores, unformatted hydrographic network
Low	1-2 %	Significant surface degradation, occasional bedsores, poorly shaped river network
Moderate	2-10 %	Small surface degradation, rare flooding, shallow, small drainage corridors
High	10-30 %	Negligible soil degradations, very well shaped hydrographic network, existence of drainage network
Very High	30 %	Mountainous terrain

* Rounded to the nearest integer, which means that the first class corresponds to slopes <0.5 %, the second to gradients between 0.5 to 2.5 % and so on.