

**Table S1 Look-up table of parameters in flow velocity equations in relation to land cover type**

Corine code	Land cover type	K (Darcy–Weisbach)	n (Manning's)	a (SCS)
111	Continuous urban fabric	1000	0.03	2.96
112	Discontinuous urban fabric	1000	0.05	2.96
121	Industrial or commercial units	1000	0.03	2.96
124	Airports	1000	0.05	2.96
131	Mineral extraction sites	1000	0.05	2.96
133	Construction sites	1000	0.05	2.96
142	Sportand leisure facilities	1000	0.03	2.96
211	Non-irrigated arable land	4000	0.12	2.06
212	Permanently irrigated land	4000	0.12	2.06
221	Vine yards	4000	0.15	2.06
222	Fruit trees and berry plantations	4000	0.15	2.06
223	Olive groves	4000	0.12	2.06
231	Pastures	15000	0.25	2.59
241	Annual crops associated with permanent crops	15000	0.25	2.59
242	Complex cultivation	15000	0.25	2.59
243	Land principally occupied by agriculture,with significant areas of natural vegetation	10000	0.15	2.59
244	Agro-forestry areas	15000	0.3	2.59
311	Broad-leaved forest	20000	0.6	0.73
312	Coniferous forest	20000	0.6	0.73
313	Mixed forest	20000	0.6	0.73
321	Natural grass land	15000	0.25	2.59
322	Moors and heathland	15000	0.25	2.59
323	Sclerophyllous vegetation	15000	0.25	2.59
324	Transitional woodland shrub	15000	0.25	2.59
331	Beaches, dunes, and sandplains	15000	0.3	2.59
332	Bare rock	2000	0.1	2.96
333	Sparsely vegetated areas	10000	0.13	2.59
334	Burnt areas	2000	0.1	2.96