Supplementary Material A: Streamflow monitoring data

Measured velocity data & Cross section in Loussios River, Arcadia, Greece

Table S1. Velocity measurements in Loussios River at the Atsicholos Bridge monitoring station

distance from left to right (m)	depth (m)	surface velocity (m/s)	at 10% depth	at 20% depth	at 30% depth	at 40% depth	at 50% depth	at 60% depth	at 70% depth	at 80% depth	at 90% depth	bottom (6.5 cm)
0	0	0	0	0	0	0	0	0	0	0	0	0
0.4	0.050	-	-	-	-	-	-	-	-	-	-	-
1	0.284	0.402	0.492	0.612	0.694	0.619	0.638	0.625	0.534	-	-	0.487
1.5	0.414	0.492	0.643	0.763	0.771	0.793	0.741	0.607	0.520	0.418	-	0.309
2	0.465	0.550	0.701	0.816	0.786	0.756	0.824	0.701	0.714	0.661	-	0.643
2.5	0.496	0.511	0.643	0.694	0.756	0.687	0.741	0.741	0.643	0.649	-	0.631
3	0.531	0.417	0.524	0.649	0.655	0.649	0.655	0.619	0.655	0.612	-	0.561
3.5	0.533	0.420	0.619	0.668	0.649	0.655	0.649	0.619	0.601	0.534	-	0.524
4	0.616	0.529	0.655	0.771	0.800	0.771	0.727	0.655	0.707	0.607	-	0.511
4.5	0.585	0.668	0.763	0.876	0.859	0.876	0.916	0.876	0.85	0.763	-	0.631
5	0.565	0.859	0.832	0.952	0.943	1.000	0.816	0.655	0.482	0.520	-	0.487
5.5	0.456	0.934	0.961	0.980	1.047	1.098	1.098	1.050	0.943	0.911	-	0.721
6	0.461	1.05	1.077	1.050	1.05	1.098	1.087	1.019	0.901	0.850	-	0.779
6.5	0.489	1.087	1.047	1.040	1.166	1.109	1.05	1.056	0.952	0.916	-	0.876
7	0.539	1.133	1.050	1.290	1.166	1.144	0.991	1.010	0.892	0.800	-	0.721
7.5	0.591	1.260	1.260	1.178	1.260	1.223	1.122	1.050	1.010	0.763	-	0.529
8	0.664	1.371	1.523	1.358	1.332	1.290	1.316	1.190	1.077	1.098	-	0.884
8.5	0.751	1.329	1.800	1.577	1.454	1.469	1.386	1.266	1.260	1.050	-	0.891
9	0.719	1.593	1.562	1.593	1.426	1.211	1.345	1.040	1.027	1.050	-	0.68
9.5	0.735	1.782	1.399	1.109	1.278	1.144	1.155	1.040	0.786	0.741	0.325	0.259
10	0.652	1.562	1.303	1.412	1.399	1.577	1.12	0.561	0.178	0.217	-	0.100
10.5	0.585	1.316	1.266	1.190	1.266	1.316	1.385	1.399	0.952	0.596	-	0.55
11	0.610	0.524	0.668	0.768	0.741	0.751	0.756	0.383	0.238	0.193	0.204	0.221
11.5	0.620	0.183	0.326	0.422	0.394	0.301	0.39	0.304	0.418	0.282	-	0.198
12	0.517	0.194	0.117	0.153	0.210	0.168	0.144	0.106	0.129	0.150	-	0.133
12.5	0.430	0.182	0.193	0.180	0.113	0.185	0.165	0.171	0.138	0.168	-	0.119
12.7	0	0	0	0	0	0	0	0	0	0	0	0

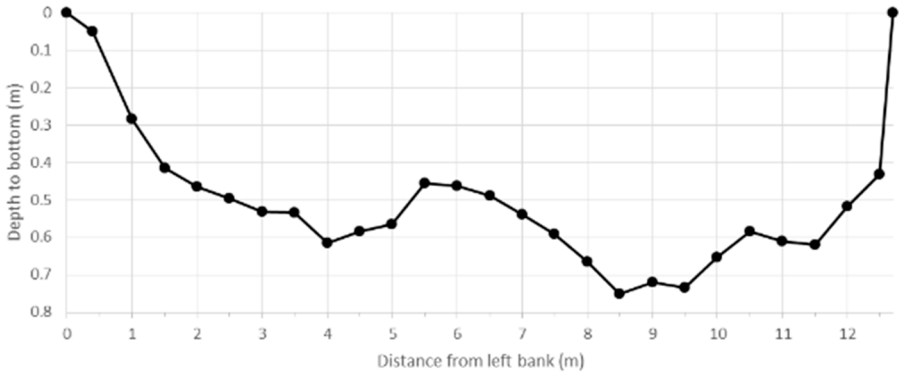


Figure S1 - Loussios River: Cross-section at Atsicholos Bridge, near the town of Karytaina, Arcadia

Measured velocity data & Cross section in Evrotas River, Laconia, Greece

Table S2: Velocity measurements in Evrotas River near Karavas Village

distance from left to right (m)	depth (m)	surface velocity (m/s)	velocity (m/s) at depth			
			20%	40%	60%	80%
0	0	0.000	0.000	0.000	0.000	0.000
0.5	0.641	0.329	0.352	0.268	0.204	0.182
1	0.65	0.345	0.390	0.451	0.390	0.289
1.5	0.735	0.460	0.649	0.515	0.380	0.320
2	0.853	0.771	0.680	0.545	0.349	0.298
2.5	0.862	0.981	0.952	0.756	0.506	0.329
3	0.883	1.260	1.109	1.000	0.952	0.649
3.5	0.407	1.155	1.190	1.266	1.234	1.234
4	0.699	0.638	0.763	0.655	0.607	0.405
4.5	0.73	0.370	0.487	0.492	0.247	0.154
5	0.722	0.335	0.314	0.349	0.133	0.073
5.5	0.754	0.259	0.271	0.178	0.092	-
6	0.678	0.202	0.160	0.187	0.127	0.060
6.5	0.586	0.215	0.235	0.148	0.140	0.111
7	0.478	0.203	0.086	0.098	0.067	0.068
7.5	0.367	0.134	0.110	0.091	0.035	0.009
8	0.307	0.071		0.005		
8.5	0.155	0.009				
9	0.0	0.000				

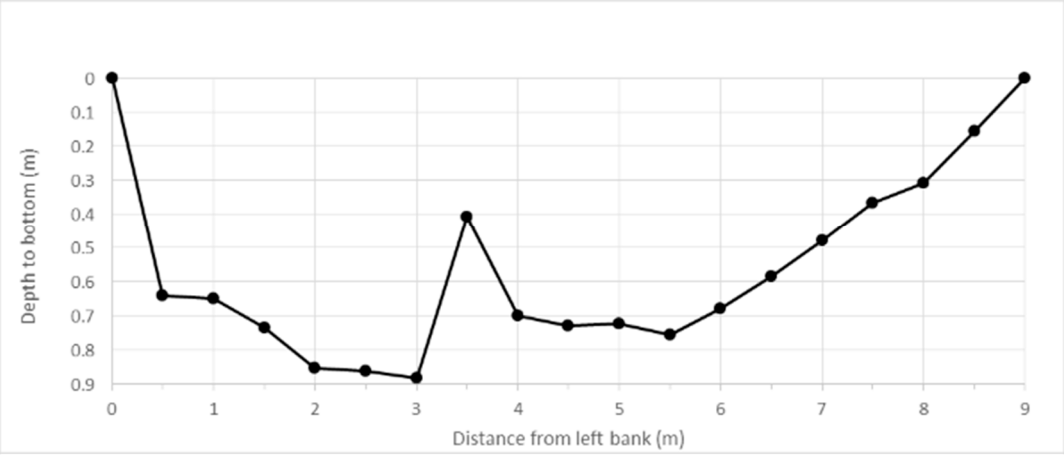


Figure S2 - **Evrotas River:** Cross-section near the village of Karavas, Laconia

Supplementary Material B: Statistical evaluation of fitting logarithmic profiles to the field data

Linearisation of exponential fitted trendlines: $V = \beta o + \beta 1 \ln y$

Relative RMSE (%) = $\frac{\sqrt{\sum (V - V_{est.})^2 / n}}{\bar{V}}$

Mean bias error (MBE) = $< V - V_{est.} >$

LOUSIOS

Profile at x = 6 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.2378	1.1431	1.3325	1.59E-09
β1	0.1569	0.0998	0.2140	0.0002
rel. RMSE (%)		0.0476		
MBE		0.0038		
Profile at x = 6.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.2006	1.1063	1.2950	1.97E-09
β1	0.1149	0.0564	0.1733	0.0019
rel. RMSE (%)		0.0545		
MBE		0.0182		
Profile at x = 7 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.3462	1.2101	1.4822	1.44E-08
β1	0.2335	0.1452	0.3218	0.0003
rel. RMSE (%)		0.0759		
MBE		0.0004		
Profile at x = 7.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.5089	1.4120	1.6058	3.95E-10
β1	0.3373	0.2716	0.4030	2.37E-06
rel. RMSE (%)		0.0519		
MBE		-0.0006		
Profile at x = 8.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.5338	1.4488	1.6187	1.22E-10
β1	0.2397	0.1788	0.3006	1.74E-05
rel. RMSE (%)		0.0438		
MBE		-0.0036		

Profile at x = 8.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.6758	1.5055	1.8462	1.51E-08
β1	0.2985	0.1688	0.4281	0.0007
rel. RMSE (%)		0.0965		
MBE		0.0003		
Profile at x = 9.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.6875	1.5407	1.8342	4.4E-09
β1	0.3824	0.2730	0.4917	4.13E-05
rel. RMSE (%)		0.0808		
MBE		-0.0012		
Profile at x = 9.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.6344	1.4491	1.8196	9.25E-09
β1	0.5050	0.3807	0.6293	7.18E-06
rel. RMSE (%)		0.1398		
MBE		-0.0081		

EVROTAS

Profile at x = 0.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.3900	0.2862	0.4938	0.0013
β1	0.1111	0.0273	0.1948	0.0243
rel. RMSE (%)		0.1026		
MBE		-0.0006		
Profile at x = 2.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.7821	0.5875	0.9767	0.0010
β1	0.3094	0.1132	0.5056	0.0152
rel. RMSE (%)		0.1195		
MBE		0.0009		
Profile at x = 2.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.0640	0.9033	1.2248	0.0002
β1	0.4442	0.2807	0.6078	0.0033
rel. RMSE (%)		0.0720		
MBE		0.0004		
Profile at x = 3.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*

βo	1.2720	1.1423	1.4017	0.0001
β1	0.3544	0.2198	0.4890	0.0036
rel. RMSE (%)		0.0421		
MBE		0.0002		
Profile at x = 4.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.8018	0.5888	1.0148	0.0013
β1	0.1845	0.0012	0.3677	0.0492
rel. RMSE (%)		0.1029		
MBE		0.0002		
Profile at x = 5.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.4269	0.2548	0.5990	0.0042
β1	0.1884	0.0366	0.3402	0.0289
rel. RMSE (%)		0.2087		
MBE		0.0009		
Profile at x = 5.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.3062	0.2007	0.4117	0.0027
β1	0.1411	0.0449	0.2374	0.0186
rel. RMSE (%)		0.1801		
MBE		-0.0006		
Profile at x = 6.0 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.2373	0.1720	0.3026	0.0014
β1	0.0857	0.0308	0.1406	0.0156
rel. RMSE (%)		0.1196		
MBE		0.0005		
Profile at x = 7.5 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	0.2145	0.1459	0.2831	0.0014
β1	0.0828	0.0439	0.1218	0.0156
rel. RMSE (%)		0.1578		
MBE		-0.0005		

ALAGONIA

Profile at x = 0.7 m				
	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	1.4052	1.2840	1.5263	4.11E-09

β1	0.3396	0.2579	0.4213	1.17E-05
rel. RMSE (%)	0.0729			
MBE	0.0002			

VENOGE

	value	*Lower 95%*	*Upper 95%*	*P-value*
βo	-0.2000	-0.2200	-0.1801	1.216E-12
β1	0.5389	0.5289	0.5489	1.584E-23
rel. RMSE (%)	0.0081			
MBE	-0.0001			