

Supplementary material

Table S1. Kolmogorov-Smirnov (K-S) test of BOD₅ for each WWTP in each year.

WWTP	Year	Kolmogorov-Smirnov Computed	Alfa	Table of Kolmogorov-Smirnov	The Hypothesized log- Normal should ...
A	2018	0.190532	0.01	0.205361	not be rejected
A	2015	0.122361	0.01	0.22604	not be rejected
A	2017	0.168168	0.01	0.205361	not be rejected
A	2016	0.091794	0.01	0.200639	not be rejected
A	2019	0.104568	0.01	0.199136	not be rejected
B	2017	0.192217	0.01	0.223898	not be rejected
B	2018	0.223569	0.01	0.223898	not be rejected
B	2015	0.241789	0.01	0.223898	be rejected
B	2016	0.226988	0.01	0.228246	not be rejected
B	2019	0.212162	0.01	0.157578	be rejected
C	2017	0.101763	0.01	0.163	not be rejected
C	2016	0.177437	0.01	0.159835	be rejected
C	2015	0.139456	0.01	0.160609	not be rejected
D	2018	0.162752	0.01	0.173759	not be rejected
D	2019	0.173315	0.01	0.26931	not be rejected
D	2015	0.130408	0.01	0.228246	not be rejected
D	2017	0.164349	0.01	0.22604	not be rejected
D	2016	0.140821	0.01	0.22604	not be rejected
E	2017	0.135126	0.01	0.178916	not be rejected
E	2018	0.152746	0.01	0.169939	not be rejected
E	2015	0.168618	0.01	0.178916	not be rejected
E	2019	0.128165	0.01	0.169939	not be rejected
E	2016	0.135295	0.01	0.184561	not be rejected
F	2018	0.168038	0.01	0.142414	be rejected
F	2017	0.238203	0.01	0.133985	be rejected
F	2016	0.195278	0.01	0.160609	be rejected
F	2019	0.167197	0.01	0.144639	be rejected
F	2015	0.096384	0.01	0.138255	not be rejected
G	2018	0.166138	0.01	0.186974	not be rejected
G	2019	0.153523	0.01	0.202177	not be rejected
G	2016	0.178048	0.01	0.190777	not be rejected
G	2017	0.076902	0.01	0.197667	not be rejected
G	2015	0.095287	0.01	0.194822	not be rejected
H	2017	0.328627	0.01	0.200639	be rejected
H	2018	0.132596	0.01	0.21012	not be rejected
H	2019	0.172906	0.01	0.23076	not be rejected
I	2017	0.280169	0.01	0.26931	be rejected
I	2019	0.145045	0.01	0.37543	not be rejected
I	2018	0.310925	0.01	0.26931	be rejected
I	2016	0.287367	0.01	0.26931	be rejected
I	2015	0.269626	0.01	0.26931	be rejected
J	2016	0.135076	0.01	0.150054	not be rejected
J	2018	0.165348	0.01	0.159072	be rejected
J	2015	0.175373	0.01	0.165501	be rejected

J	2017	0.140152	0.01	0.159835	not be rejected
J	2019	0.092099	0.01	0.164655	not be rejected
K	2018	0.120504	0.01	0.22425	not be rejected
K	2016	0.125901	0.01	0.22425	not be rejected
K	2019	0.152894	0.01	0.23076	not be rejected
K	2017	0.100173	0.01	0.22743	not be rejected
K	2015	0.313877	0.01	0.210432	be rejected
L	2016	0.290082	0.01	0.21273	be rejected
L	2015	0.17428	0.01	0.210432	not be rejected
L	2017	0.253958	0.01	0.21826	be rejected
L	2019	0.134707	0.01	0.22119	not be rejected
L	2018	0.158877	0.01	0.22119	not be rejected
M	2019	0.092419	0.01	0.221815	not be rejected
M	2018	0.159135	0.01	0.200639	not be rejected
M	2016	0.155816	0.01	0.196229	not be rejected
M	2017	0.128296	0.01	0.217818	not be rejected
M	2015	0.224655	0.01	0.200639	be rejected
N	2019	0.111487	0.01	0.22743	not be rejected
N	2018	0.135936	0.01	0.22425	not be rejected
N	2016	0.109677	0.01	0.22425	not be rejected
N	2017	0.147608	0.01	0.22743	not be rejected
N	2015	0.305387	0.01	0.210432	be rejected
O	2018	0.157963	0.01	0.22119	not be rejected
O	2016	0.181215	0.01	0.22743	not be rejected
O	2019	0.170685	0.01	0.22425	not be rejected
O	2017	0.162508	0.01	0.22743	not be rejected
O	2015	0.236828	0.01	0.210432	be rejected
P	2016	0.098952	0.01	0.22743	not be rejected
P	2018	0.148309	0.01	0.22425	not be rejected
P	2015	0.123197	0.01	0.212208	not be rejected
P	2019	0.140713	0.01	0.22425	not be rejected
P	2017	0.095834	0.01	0.22743	not be rejected

Table S2. Kolmogorov-Smirnov (K-S) test of COD for each WWTP in each year.

WWTP	Year	Kolmogorov-Smirnov computed	Alfa	Table of Kolmogorov-Smirnov	The hypothesized log- normal should ...
A	2018	0.053458	0.01	0.084173	not be rejected
A	2015	0.065745	0.01	0.22604	not be rejected
A	2017	0.048907	0.01	0.085553	not be rejected
A	2019	0.053703	0.01	0.084854	not be rejected
A	2016	0.059598	0.01	0.084285	not be rejected
B	2017	0.12954	0.01	0.159072	not be rejected
B	2015	0.111999	0.01	0.159072	not be rejected
B	2016	0.147463	0.01	0.161394	not be rejected
B	2018	0.083457	0.01	0.159072	not be rejected
B	2019	0.124449	0.01	0.157578	not be rejected
C	2017	0.11179	0.01	0.162191	not be rejected
C	2016	0.069008	0.01	0.159835	not be rejected
C	2015	0.104069	0.01	0.160609	not be rejected

D	2019	0.199637	0.01	0.25907	not be rejected
D	2018	0.249059	0.01	0.25907	not be rejected
D	2015	0.169159	0.01	0.22119	not be rejected
D	2016	0.249707	0.01	0.25907	not be rejected
D	2017	0.176462	0.01	0.25907	not be rejected
E	2018	0.126981	0.01	0.17087	not be rejected
E	2017	0.141919	0.01	0.177848	not be rejected
E	2019	0.120622	0.01	0.169939	not be rejected
E	2015	0.142351	0.01	0.178916	not be rejected
E	2016	0.106009	0.01	0.184561	not be rejected
F	2017	0.222757	0.01	0.086028	be rejected
F	2018	0.158238	0.01	0.088529	be rejected
F	2019	0.117284	0.01	0.089865	be rejected
F	2016	0.11734	0.01	0.099383	be rejected
F	2015	0.091364	0.01	0.087252	be rejected
G	2018	0.075777	0.01	0.185756	not be rejected
G	2019	0.06534	0.01	0.186974	not be rejected
G	2016	0.144673	0.01	0.190777	not be rejected
G	2017	0.080932	0.01	0.197667	not be rejected
G	2015	0.070522	0.01	0.194822	not be rejected
H	2018	0.154555	0.01	0.248573	not be rejected
H	2019	0.108152	0.01	0.23076	not be rejected
H	2017	0.100226	0.01	0.200639	not be rejected
I	2017	0.152504	0.01	0.26931	not be rejected
I	2018	0.136399	0.01	0.26931	not be rejected
I	2019	0.153308	0.01	0.37543	not be rejected
I	2015	0.40462	0.01	0.26931	be rejected
I	2016	0.413898	0.01	0.26931	be rejected
J	2015	0.050766	0.01	0.164655	not be rejected
J	2018	0.088998	0.01	0.159072	not be rejected
J	2016	0.065269	0.01	0.150054	not be rejected
J	2019	0.088111	0.01	0.164655	not be rejected
J	2017	0.064957	0.01	0.159835	not be rejected
K	2019	0.051423	0.01	0.107015	not be rejected
K	2018	0.071735	0.01	0.106104	not be rejected
K	2015	0.080557	0.01	0.104998	not be rejected
K	2017	0.077419	0.01	0.104998	not be rejected
K	2016	0.090121	0.01	0.10435	not be rejected
L	2016	0.150893	0.01	0.10435	be rejected
L	2015	0.109653	0.01	0.104998	be rejected
L	2019	0.103964	0.01	0.104565	not be rejected
L	2018	0.12002	0.01	0.10588	be rejected
L	2017	0.106385	0.01	0.104565	be rejected
M	2019	0.079521	0.01	0.210432	not be rejected
M	2018	0.090195	0.01	0.197667	not be rejected
M	2016	0.121158	0.01	0.196229	not be rejected
M	2017	0.087496	0.01	0.192097	not be rejected
M	2015	0.125483	0.01	0.200639	not be rejected
N	2019	0.082905	0.01	0.112481	not be rejected
N	2018	0.094505	0.01	0.110907	not be rejected
N	2016	0.056505	0.01	0.10435	not be rejected

N	2015	0.076176	0.01	0.104998	not be rejected
N	2017	0.074497	0.01	0.104565	not be rejected
O	2018	0.115327	0.01	0.106104	be rejected
O	2015	0.105749	0.01	0.104565	be rejected
O	2016	0.09478	0.01	0.10435	not be rejected
O	2019	0.115778	0.01	0.104998	be rejected
O	2017	0.119404	0.01	0.104998	be rejected
P	2015	0.07564	0.01	0.104565	not be rejected
P	2016	0.0637	0.01	0.104565	not be rejected
P	2019	0.061787	0.01	0.104998	not be rejected
P	2017	0.070502	0.01	0.104998	not be rejected
P	2018	0.115494	0.01	0.10588	be rejected

Table S3. Kolmogorov-Smirnov (K-S) test of TSS for each WWTP in each year.

WWTP	Year	Kolmogorov-Smirnov computed	Alfa	Table of Kolmogorov-Smirnov	The hypothesized log- normal should ...
A	2019	0.093899	0.01	0.200639	not be rejected
A	2015	0.111446	0.01	0.22604	not be rejected
A	2016	0.164377	0.01	0.202177	not be rejected
A	2017	0.101287	0.01	0.205361	not be rejected
A	2018	0.108231	0.01	0.20375	not be rejected
B	2017	0.163583	0.01	0.157578	be rejected
B	2015	0.20906	0.01	0.159072	be rejected
B	2016	0.181954	0.01	0.161394	be rejected
B	2018	0.164263	0.01	0.159072	be rejected
B	2019	0.168691	0.01	0.157578	be rejected
C	2015	0.078863	0.01	0.160609	not be rejected
C	2017	0.069838	0.01	0.163	not be rejected
C	2016	0.177915	0.01	0.159835	be rejected
D	2016	0.093871	0.01	0.22604	not be rejected
D	2017	0.078932	0.01	0.223898	not be rejected
D	2019	0.129152	0.01	0.26931	not be rejected
D	2015	0.064991	0.01	0.145792	not be rejected
D	2018	0.139881	0.01	0.153338	not be rejected
E	2019	0.094803	0.01	0.17087	not be rejected
E	2016	0.102695	0.01	0.184561	not be rejected
E	2018	0.06556	0.01	0.169939	not be rejected
E	2017	0.067894	0.01	0.178916	not be rejected
E	2015	0.085723	0.01	0.178916	not be rejected
F	2018	0.211474	0.01	0.13776	be rejected
F	2019	0.162081	0.01	0.145792	be rejected
F	2017	0.197085	0.01	0.13221	be rejected
F	2016	0.186077	0.01	0.156847	be rejected
F	2015	0.124339	0.01	0.137271	not be rejected
G	2019	0.105983	0.01	0.186974	not be rejected
G	2017	0.08655	0.01	0.197667	not be rejected
G	2018	0.084949	0.01	0.185756	not be rejected
G	2015	0.069955	0.01	0.194822	not be rejected
G	2016	0.150665	0.01	0.190777	not be rejected

H	2019	0.144312	0.01	0.23076	not be rejected
H	2018	0.12122	0.01	0.248573	not be rejected
H	2017	0.23328	0.01	0.194822	be rejected
I	2016	0.249967	0.01	0.26931	not be rejected
I	2015	0.287946	0.01	0.26931	be rejected
I	2019	0.156361	0.01	0.39122	not be rejected
I	2018	0.268471	0.01	0.26931	not be rejected
I	2017	0.227942	0.01	0.26931	not be rejected
J	2019	0.089117	0.01	0.164655	not be rejected
J	2017	0.091641	0.01	0.159835	not be rejected
J	2018	0.069204	0.01	0.159072	not be rejected
J	2015	0.05555	0.01	0.164655	not be rejected
J	2016	0.055584	0.01	0.150054	not be rejected
K	2016	0.079524	0.01	0.10435	not be rejected
K	2017	0.04799	0.01	0.104998	not be rejected
K	2018	0.048521	0.01	0.106104	not be rejected
K	2019	0.075296	0.01	0.108909	not be rejected
K	2015	0.163151	0.01	0.104998	be rejected
L	2016	0.249733	0.01	0.104565	be rejected
L	2018	0.201204	0.01	0.10588	be rejected
L	2019	0.319186	0.01	0.104565	be rejected
L	2015	0.284094	0.01	0.104998	be rejected
L	2017	0.235562	0.01	0.104565	be rejected
M	2015	0.159403	0.01	0.200639	not be rejected
M	2017	0.100139	0.01	0.192097	not be rejected
M	2016	0.11082	0.01	0.196229	not be rejected
M	2019	0.087511	0.01	0.210432	not be rejected
M	2018	0.066488	0.01	0.197667	not be rejected
N	2017	0.089017	0.01	0.104565	not be rejected
N	2016	0.086532	0.01	0.10435	not be rejected
N	2018	0.087263	0.01	0.112481	not be rejected
N	2019	0.073907	0.01	0.112481	not be rejected
N	2015	0.122367	0.01	0.104998	be rejected
O	2017	0.119091	0.01	0.104998	be rejected
O	2015	0.210783	0.01	0.104565	be rejected
O	2018	0.184953	0.01	0.106104	be rejected
O	2016	0.142573	0.01	0.10435	be rejected
O	2019	0.251629	0.01	0.104998	be rejected
P	2017	0.066635	0.01	0.104998	not be rejected
P	2015	0.079816	0.01	0.104565	not be rejected
P	2016	0.10055	0.01	0.104565	not be rejected
P	2018	0.145718	0.01	0.10588	be rejected
P	2019	0.153733	0.01	0.104998	be rejected

Table S4. Welch F tests of the two AS clusters, CAS-WWTPs and EA-WWTPs, for reliability and stability.

Welch F test	Reliability	Stability
BOD ₅	1.59×10^{-5}	0.002
COD	0.011	0.030
TSS	0.100	0.138