

Zagreb air pollution

Overview

PAH_IMI 2017_2018_2019.xlsx

1095

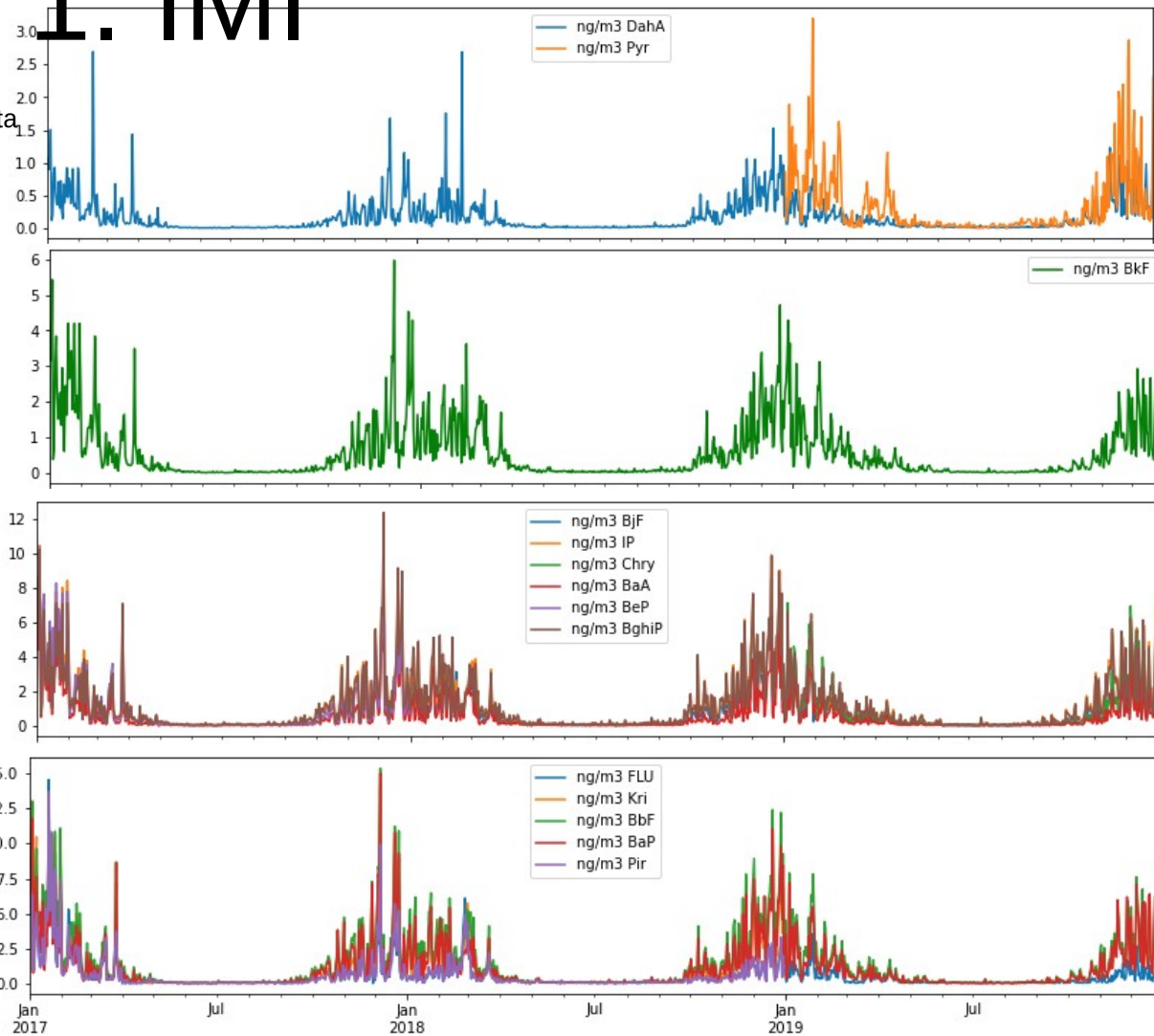
rows

1. IMI

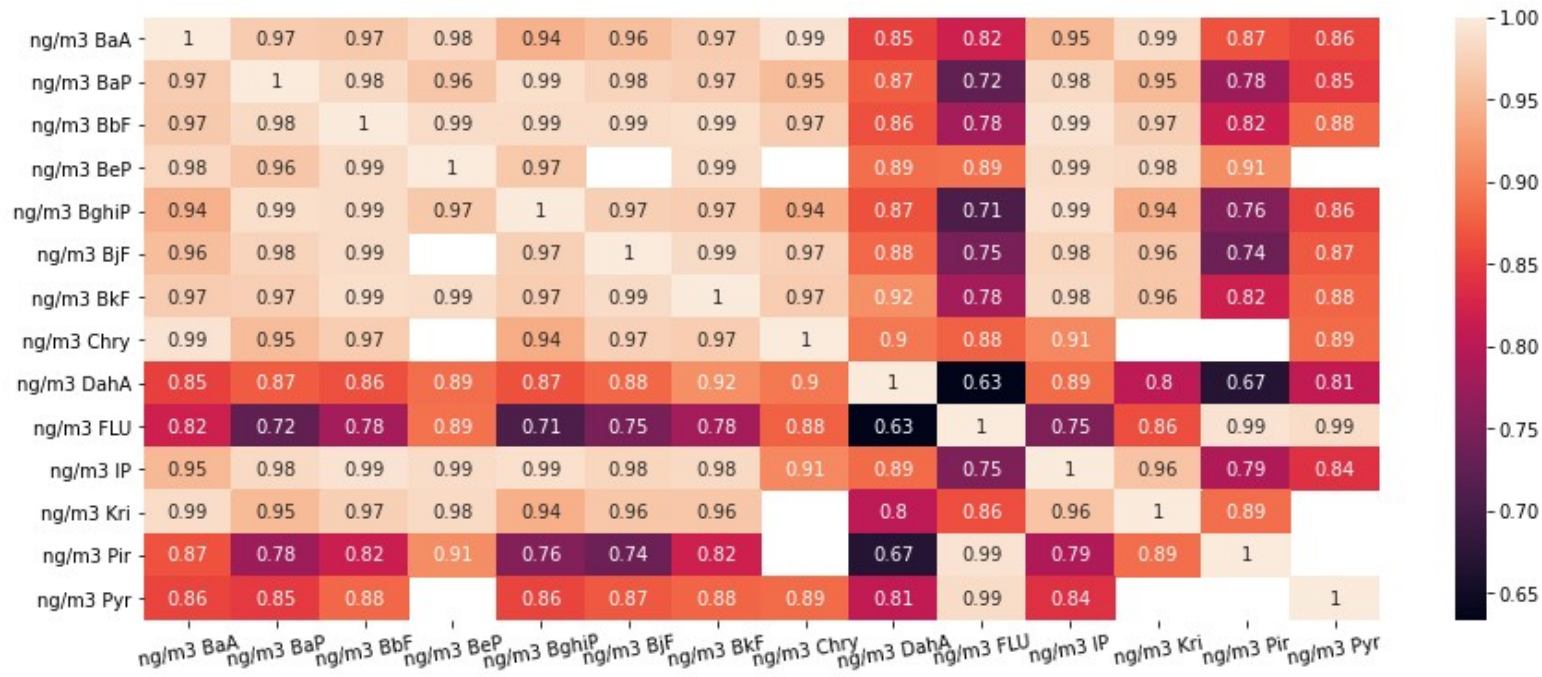
Columns having listed year data

	count	min	max
ng/m3 BaA	1093.0	0.002306	9.471825
ng/m3 BaP	1093.0	0.003743	15.035727
ng/m3 BbF	1093.0	0.003592	15.381998
ng/m3 BeP	365.0	0.010349	10.349091
ng/m3 BghiP	1093.0	0.005104	12.392755
ng/m3 BjF	728.0	0.000000	8.505419
ng/m3 BkF	1093.0	0.001588	5.971419
ng/m3 Chry	363.0	0.003289	7.269436
ng/m3 DahA	1093.0	0.000000	2.699063
ng/m3 FLU	1093.0	0.000000	14.569086
ng/m3 IP	1093.0	0.000000	11.464653
ng/m3 Kri	730.0	0.003634	14.390295
ng/m3 Pir	730.0	0.000000	13.689236
ng/m3 Pyr	363.0	0.000000	3.211908

	year
ng/m3 BeP	{2017}
ng/m3 BjF	{2018, 2019}
ng/m3 Chry	{2019}
ng/m3 Kri	{2017, 2018}
ng/m3 Pir	{2017, 2018}
ng/m3 Pyr	{2019}



Same behaviors



Many features highly correlated

metal_IMI2017_2020.xlsx

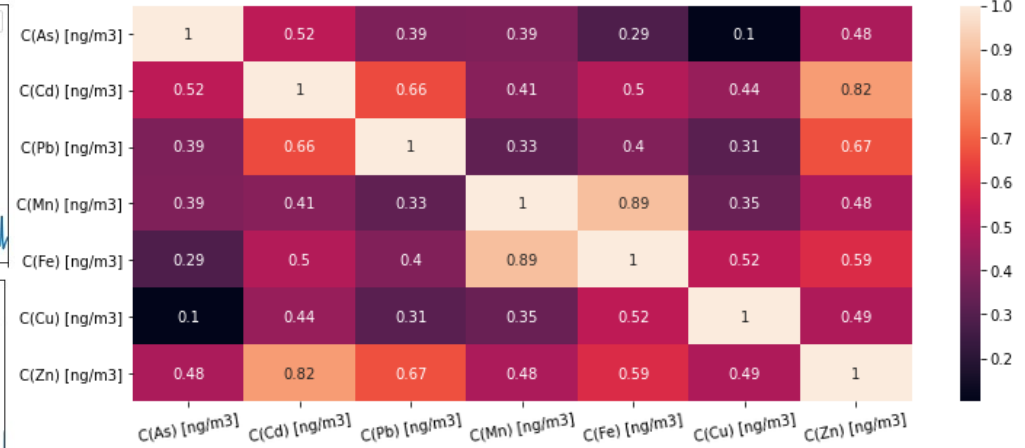
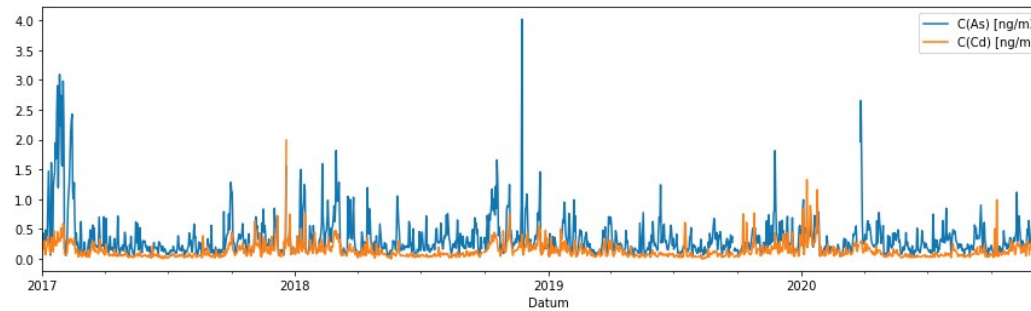
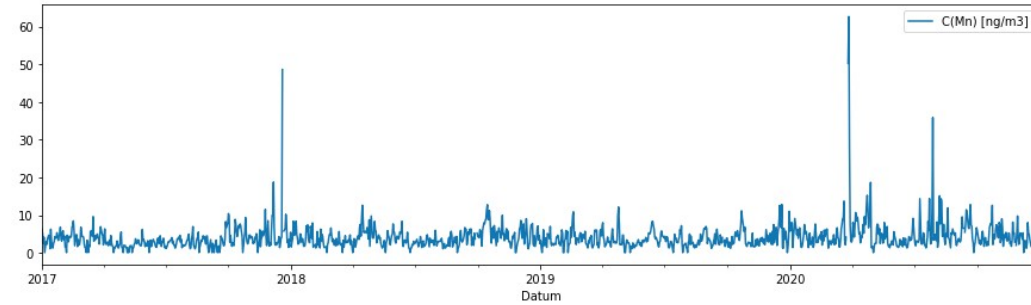
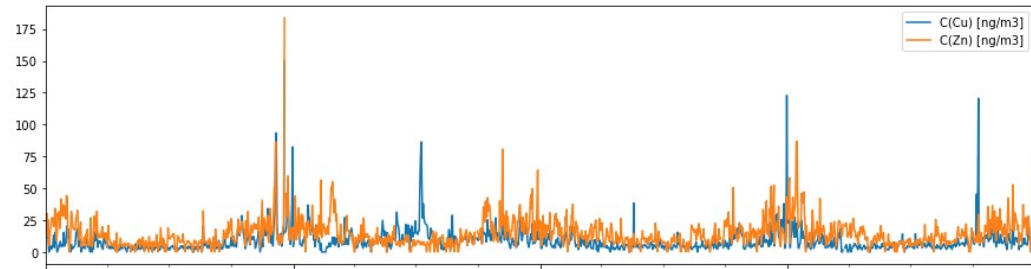
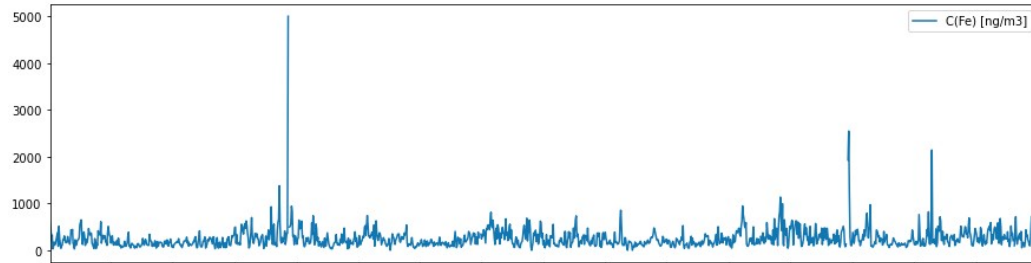
1461
rows

1. IMI

	count	min	max
C(As) [ng/m3]	1453.0	0.0018	4.017626
C(Cd) [ng/m3]	1453.0	0.0004	1.988098
C(Pb) [ng/m3]	1453.0	0.0230	126.134692
C(Mn) [ng/m3]	1453.0	0.1110	62.631426
C(Fe) [ng/m3]	1453.0	3.1300	4997.743440
C(Cu) [ng/m3]	1453.0	0.1600	150.038504
C(Zn) [ng/m3]	1453.0	0.3920	183.702797

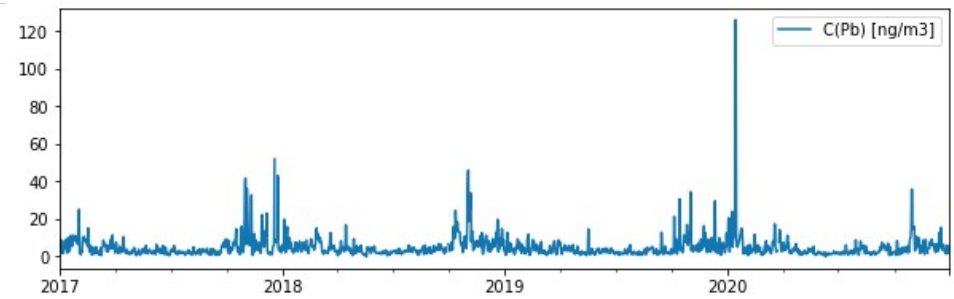
NAs

	Uzorak	C(As) [ng/m3]	C(Cd) [ng/m3]	C(Pb) [ng/m3]	C(Mn) [ng/m3]	C(Fe) [ng/m3]	C(Cu) [ng/m3]	C(Zn) [ng/m3]
Datum								
2017-12-20	I-M - 354	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2018-09-28	I-M - 271	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2018-09-29	I-M - 272	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2019-09-25	I-M - 268	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2020-03-24	I-M-084	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2020-03-25	I-M-085	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2020-09-12	I-M - 256	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2020-11-26	I-M - 331	NaN	NaN	NaN	NaN	NaN	NaN	NaN



High correlation

- Fe & Mn (0.89)
- Cd & Zn (0.82)
- Cd & Pb (0.66)
- Fe & Zn (0.59)

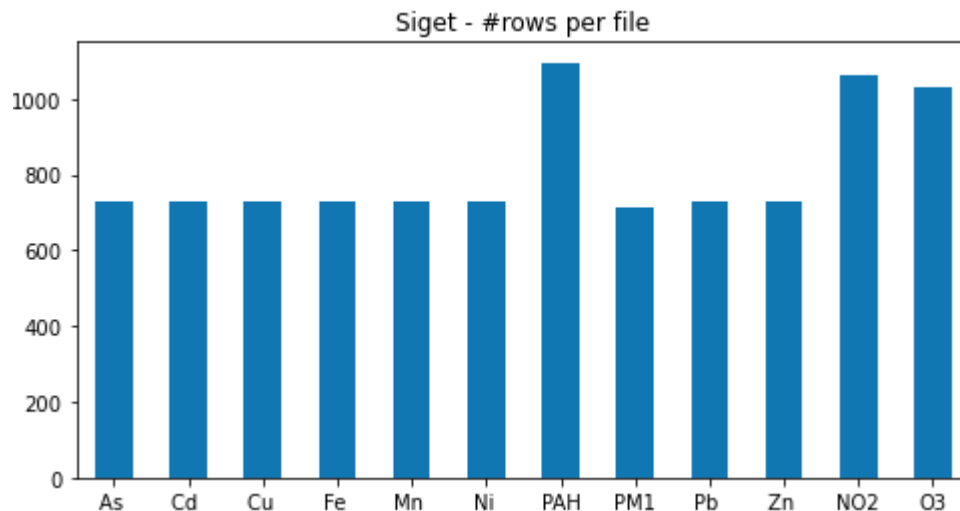


	2017	2018	2019
As	As Siget 2017.xls	As Siget 2018.xls	As Siget 2019.xls
Cd	Cd Siget 2017.xls	Cd Siget 2018.xls	Cd Siget 2019.xls
Cu	Cu Siget 2017.xls	Cu Siget 2018.xls	Cu Siget 2019.xls
Fe	Fe Siget 2017.xls	Fe Siget 2018.xls	Fe Siget 2019.xls
Mn	Mn Siget 2017.xls	Mn Siget 2018.xls	Mn Siget 2019.xls
Ni	Ni Siget 2017.xls	Ni Siget 2018.xls	Ni Siget 2019.xls
PAH	PAH_Siget 2017_2018_2019.xlsx	None	None
PM1	PM10 Siget 2017.xls	PM10 Siget 2018.xls	PM10 Siget 2019.xls
Pb	Pb Siget 2017.xls	Pb Siget 2018.xls	Pb Siget 2019.xls
Pod	Podaci NO2 O3 Siget.xlsx	None	None
Zn	Zn Siget 2017.xls	Zn Siget 2018.xls	Zn Siget 2019.xls

	2017	2018	2019	#rows
As	(0, 0)	(364, 1)	(362, 1)	726
Cd	(0, 0)	(364, 1)	(362, 1)	726
Cu	(0, 0)	(364, 1)	(362, 1)	726
Fe	(0, 0)	(364, 1)	(362, 1)	726
Mn	(0, 0)	(364, 1)	(362, 1)	726
Ni	(0, 0)	(364, 1)	(362, 1)	726
PAH	(365, 14)	(365, 14)	(365, 14)	1095
PM1	(0, 0)	(365, 1)	(347, 1)	712
Pb	(0, 0)	(364, 1)	(362, 1)	726
Zn	(0, 0)	(364, 1)	(362, 1)	726
NO2	(357, 1)	(362, 1)	(341, 1)	1060
O3	(352, 1)	(342, 1)	(338, 1)	1032

Siget – File Managment

2 files in different format



Only PAH, NO2, O3 has data in 2017

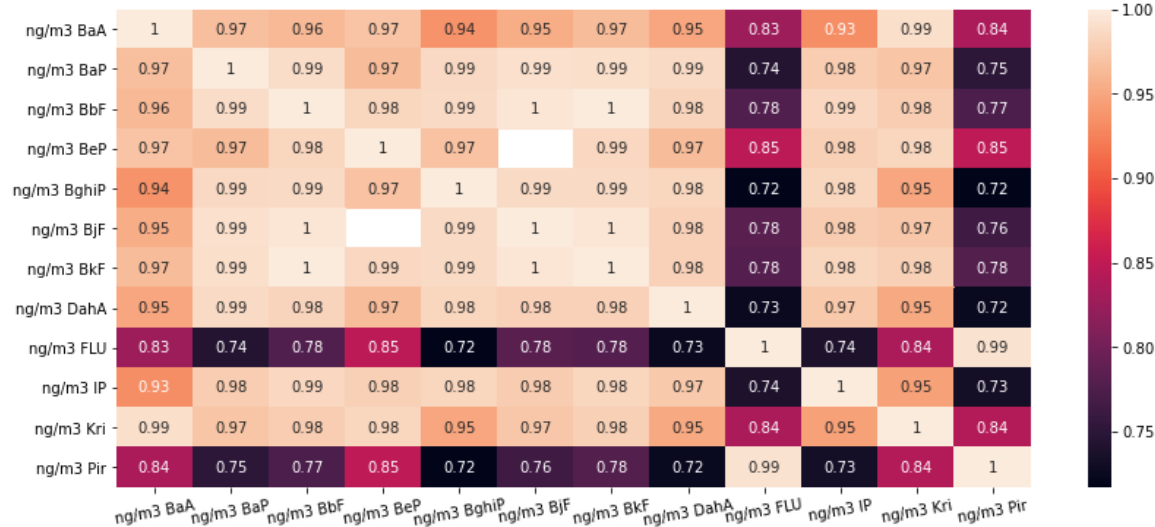
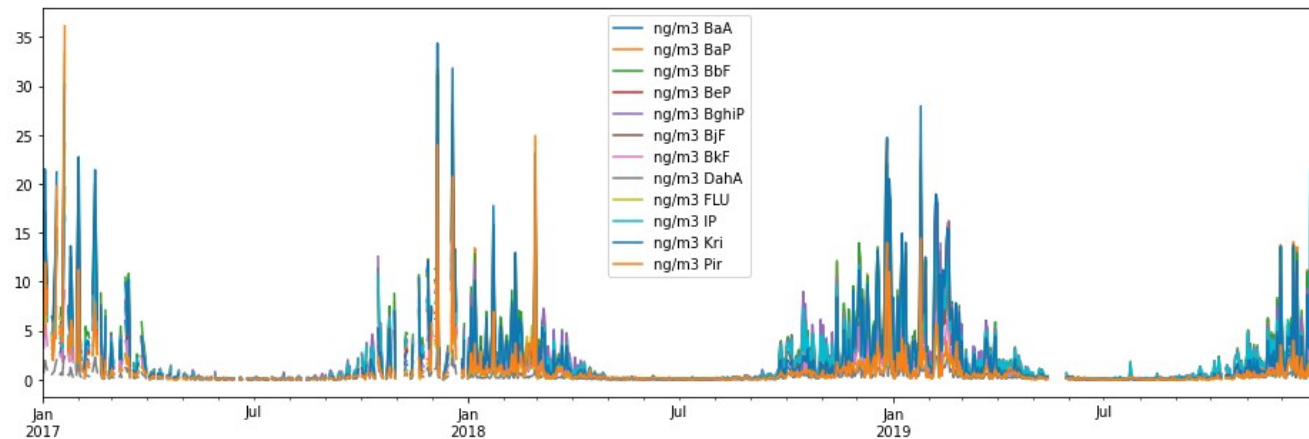
PAH_Siget 2017_2018_2019.xlsx

1095

rows

Siget

	count	min	max
ng/m3 BaA	957.0	0.0	23.598826
ng/m3 BaP	957.0	0.0	31.722936
ng/m3 BbF	957.0	0.0	31.139334
ng/m3 BeP	245.0	0.0	20.347329
ng/m3 BghiP	957.0	0.0	24.900351
ng/m3 BkF	712.0	0.0	13.803575
ng/m3 BkF	957.0	0.0	12.496493
ng/m3 DahA	957.0	0.0	3.534034
ng/m3 FLU	957.0	0.0	33.342504
ng/m3 IP	957.0	0.0	21.732226
ng/m3 Kri	957.0	0.0	34.363040
ng/m3 Pir	957.0	0.0	36.109327



Super high correlation!

Siget

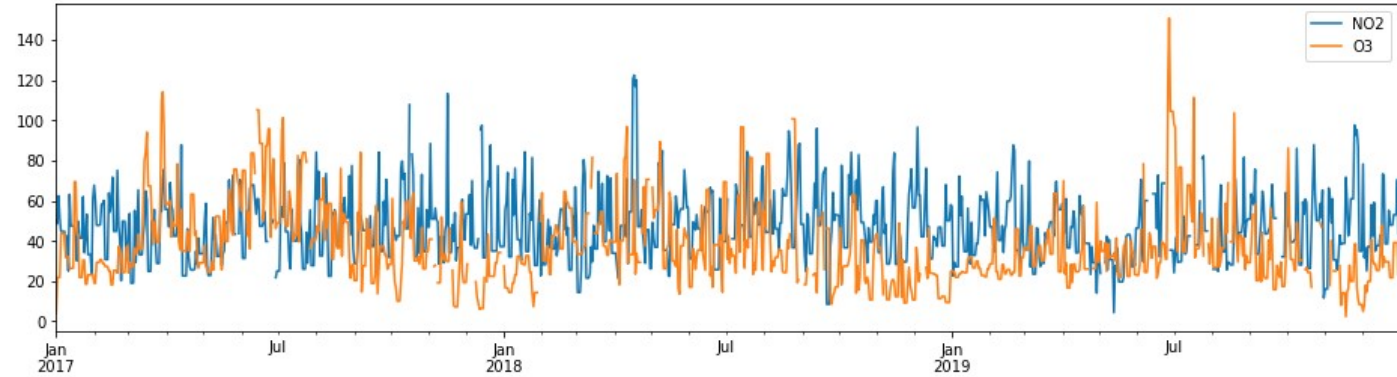
1095

rows

First look:
no pattern?

Podaci NO2 O3 Siget.xlsx

	count	min	max
NO2	1060.0	4.300319	122.500000
O3	1031.0	2.338710	150.818859



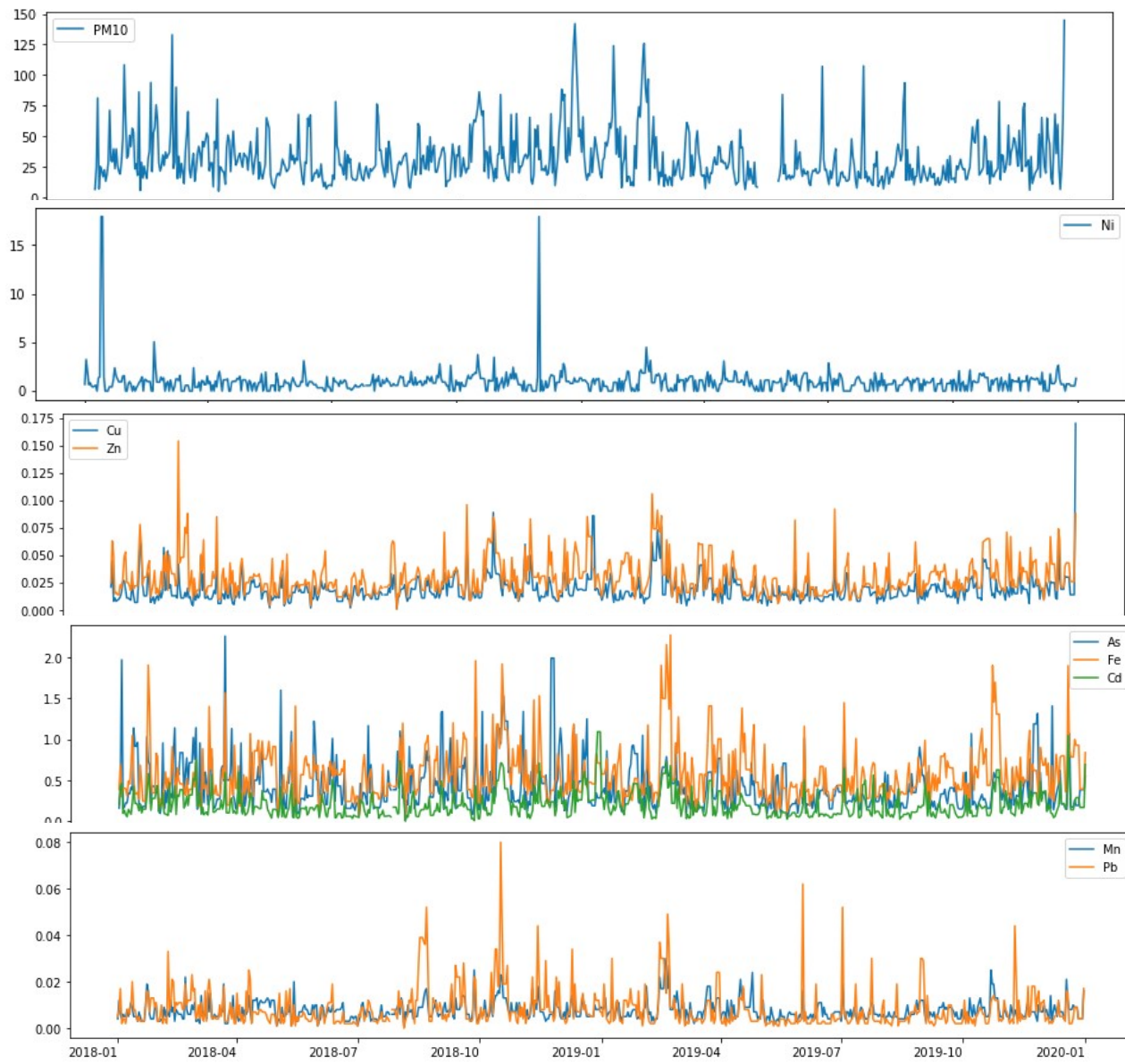
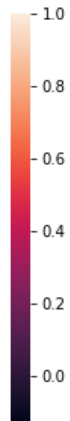
	count	min	max
As	726.0	0.000	2.263
Cd	726.0	0.001	1.092
Cu	726.0	0.001	0.170
Fe	726.0	0.015	2.278
Mn	726.0	0.001	0.030
Ni	726.0	0.000	17.939
PM10	712.0	5.500	144.700
Pb	726.0	0.000	0.080
Zn	726.0	0.001	0.154

727 rows Siget

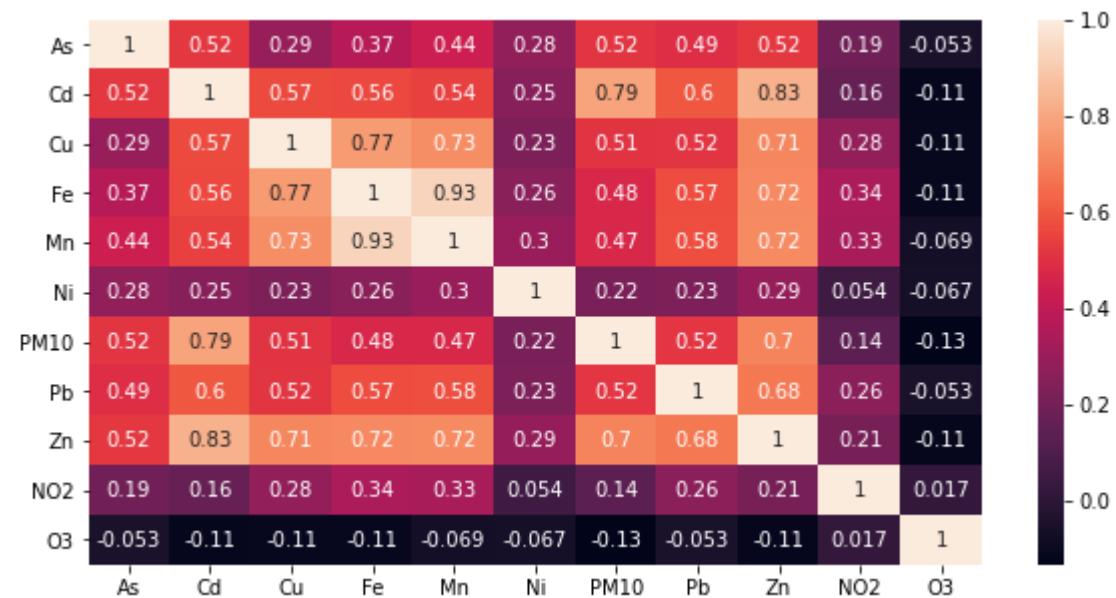
Podaci NO2 O3 Siget.xlsx

	count	min	max
NO2	1060.0	4.300319	122.500000
O3	1031.0	2.338710	150.818859

As	1	0.52	0.29	0.37	0.44	0.28	0.52	0.49	0.52	0.19	-0.053
Cd	0.52	1	0.57	0.56	0.54	0.25	0.79	0.6	0.83	0.16	-0.11
Cu	0.29	0.57	1	0.77	0.73	0.23	0.51	0.52	0.71	0.28	-0.11
Fe	0.37	0.56	0.77	1	0.93	0.26	0.48	0.57	0.72	0.34	-0.11
Mn	0.44	0.54	0.73	0.93	1	0.3	0.47	0.58	0.72	0.33	-0.069
Ni	0.28	0.25	0.23	0.26	0.3	1	0.22	0.23	0.29	0.054	-0.067
PM10	0.52	0.79	0.51	0.48	0.47	0.22	1	0.52	0.7	0.14	-0.13
Pb	0.49	0.6	0.52	0.57	0.58	0.23	0.52	1	0.68	0.26	-0.053
Zn	0.52	0.83	0.71	0.72	0.72	0.29	0.7	0.68	1	0.21	-0.11
NO2	0.19	0.16	0.28	0.34	0.33	0.054	0.14	0.26	0.21	1	0.017
O3	-0.053	-0.11	-0.11	-0.11	-0.069	-0.067	-0.13	-0.053	-0.11	0.017	1
	As	Cd	Cu	Fe	Mn	Ni	PM10	Pb	Zn	NO2	O3

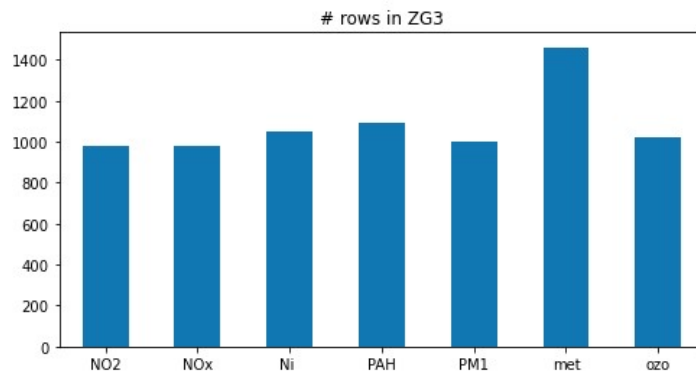


Siget



3. ZG3

	2017	2018	2019	2020	#rows
NO2	(326, 1)	(327, 1)	(328, 1)	(0, 0)	981
NOx	(326, 1)	(327, 1)	(328, 1)	(0, 0)	981
Ni	(365, 1)	(351, 1)	(331, 1)	(0, 0)	1047
PAH	(365, 14)	(365, 14)	(365, 14)	(0, 0)	1095
PM1	(331, 1)	(348, 1)	(318, 1)	(0, 0)	997
met	(365, 9)	(365, 9)	(365, 9)	(366, 9)	1461
ozo	(340, 1)	(329, 1)	(350, 1)	(0, 0)	1019



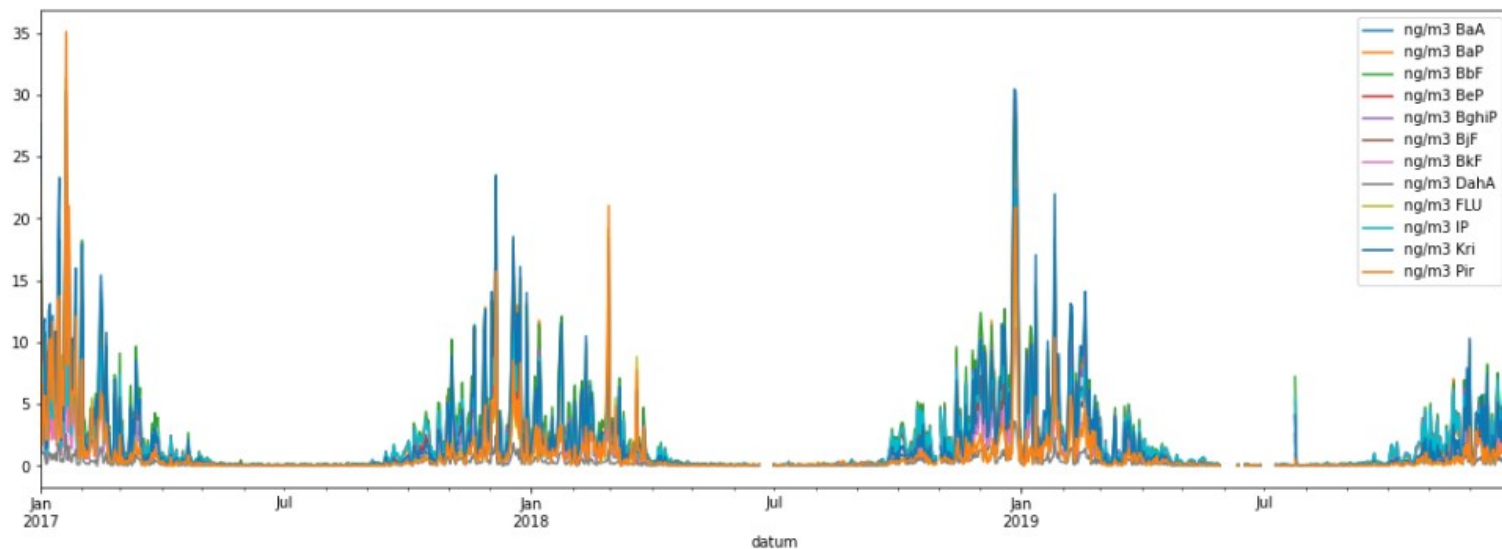
1095

ZG3

PAH_Zg3 2017_2018_2019.xlsx

rows

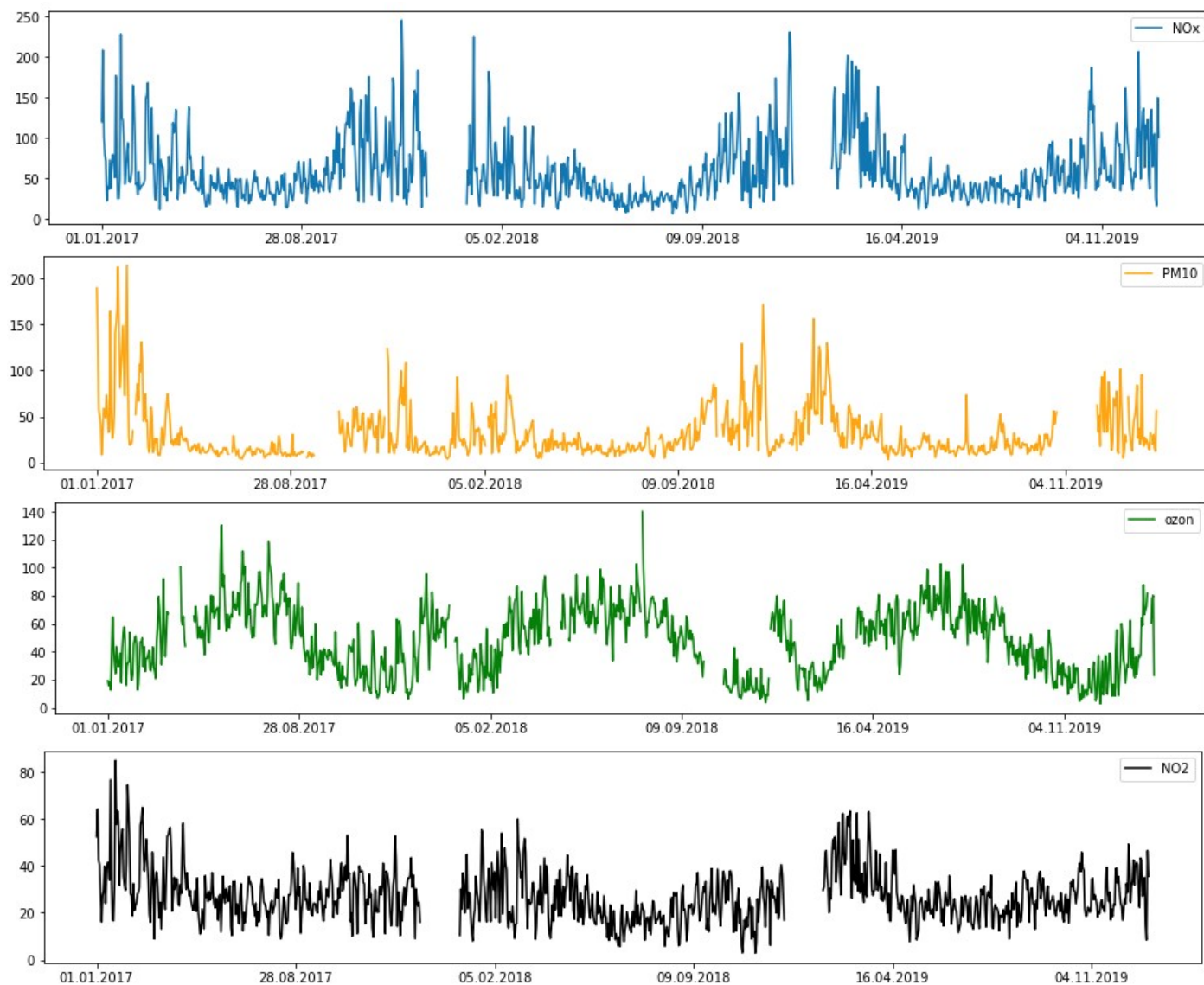
	count	min	max
ng/m3 BaA	1051.0	0.002863	22.740006
ng/m3 BaP	1051.0	0.001690	29.792382
ng/m3 BbF	1051.0	0.009266	28.412315
ng/m3 BeP	365.0	0.013621	21.353057
ng/m3 BghiP	1051.0	0.009266	22.384598
ng/m3 BkF	686.0	0.002426	17.326464
ng/m3 BkF	1051.0	0.004852	11.092706
ng/m3 DahA	1051.0	0.000000	3.627907
ng/m3 FLU	1051.0	0.000000	31.291439
ng/m3 IP	1051.0	0.007158	22.280263
ng/m3 Kri	1051.0	0.007715	30.473466
ng/m3 Pir	1051.0	0.000000	35.103421



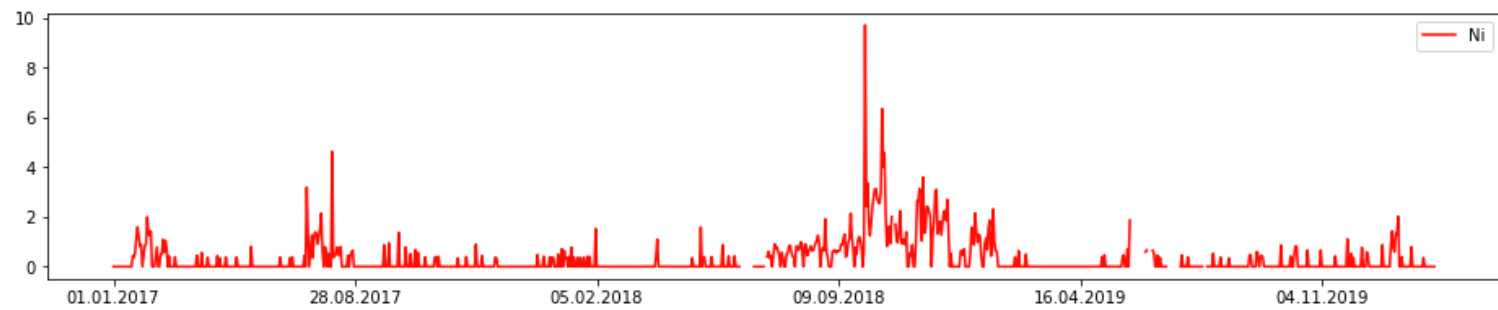
ZG3

	count	mean	min	max
NO2	981.0	26.990709	2.862	85.046
NOx	981.0	58.235622	5.965	245.526
Ni	1047.0	0.317181	0.000	9.729
PM10	997.0	31.093840	3.492	214.201
ozon	1019.0	48.058608	2.911	139.940

Incomplete data:
many gaps

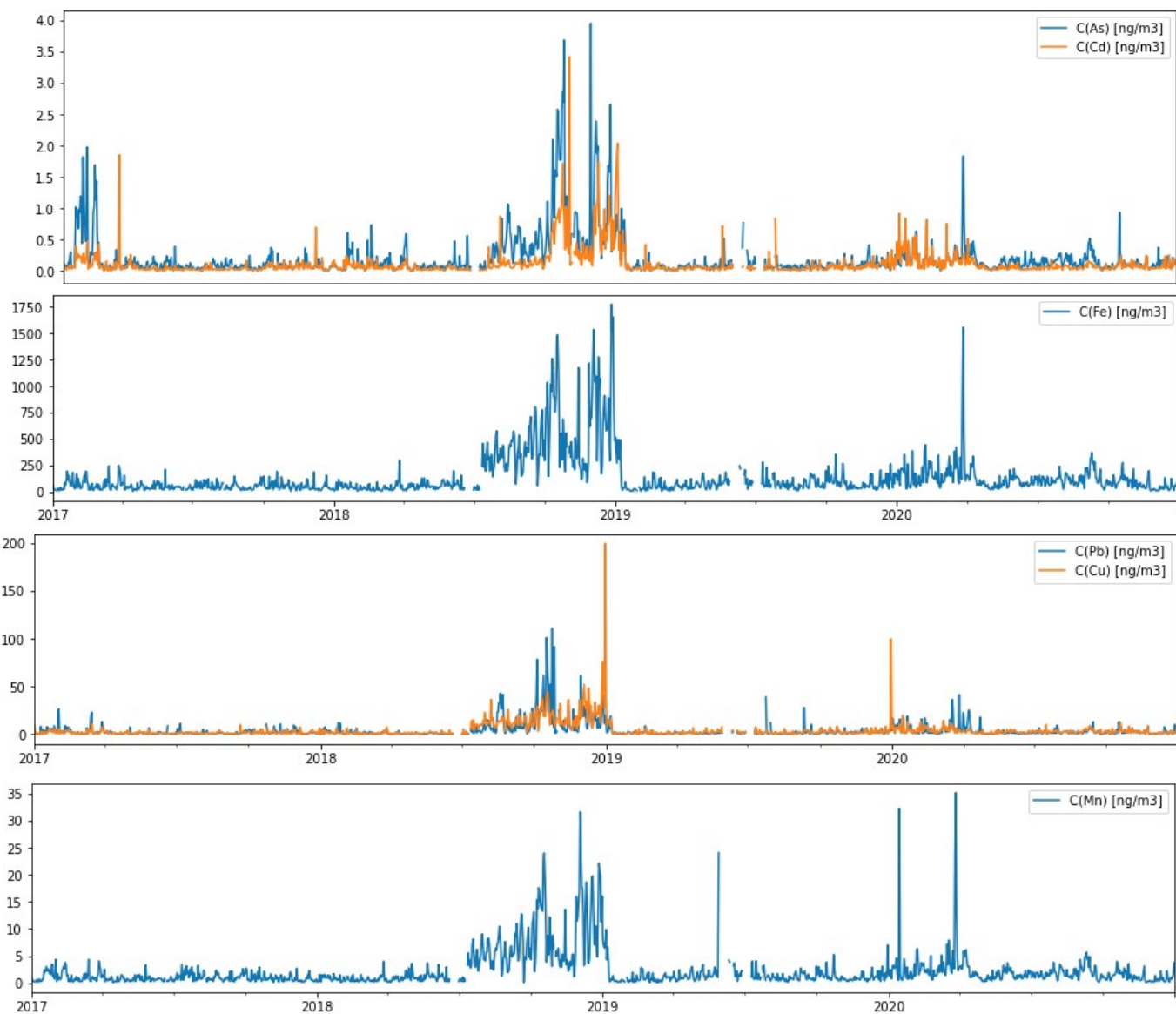


	count	mean	min	max
NO2	981.0	26.990709	2.862	85.046
NOx	981.0	58.235622	5.965	245.526
Ni	1047.0	0.317181	0.000	9.729
PM10	997.0	31.093840	3.492	214.201
ozon	1019.0	48.058608	2.911	139.940



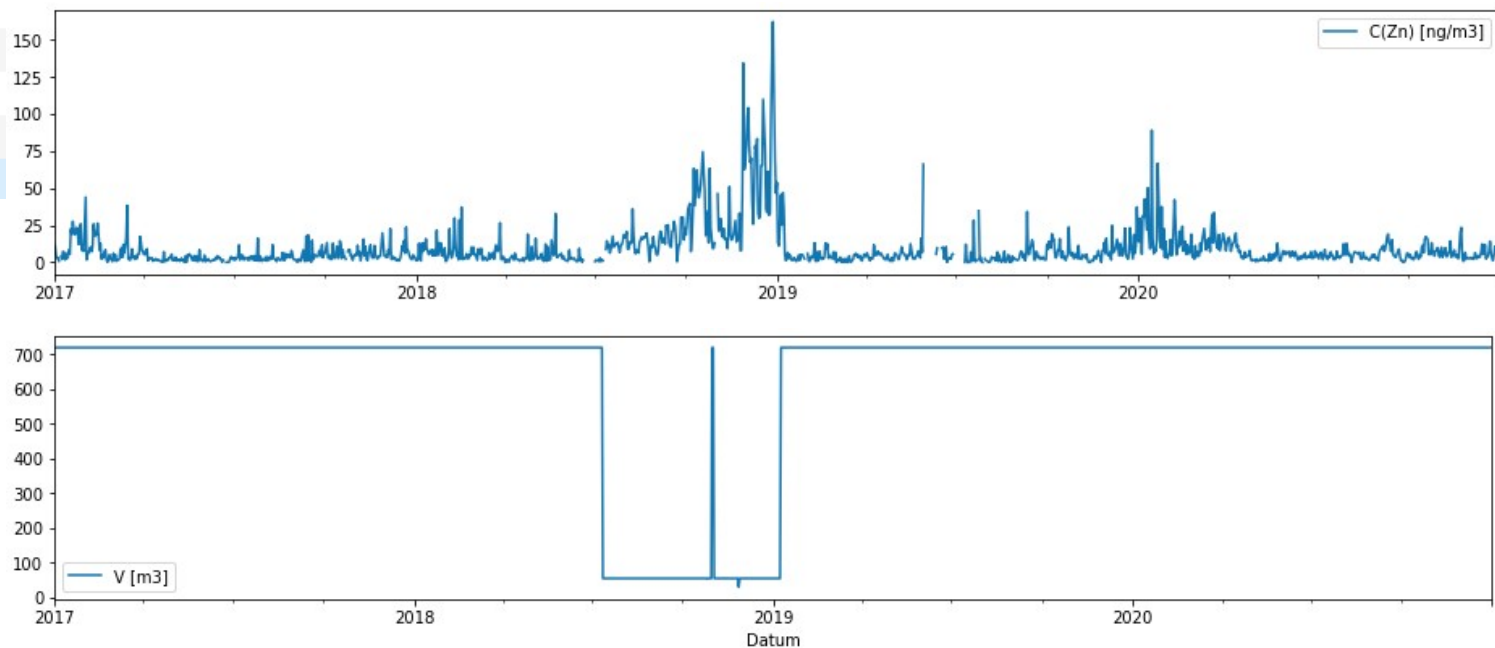
ZG3

	count	mean	min	max
V [m3]	1461.0	638.524066	30.380000	720.000000
C(As) [ng/m3]	1408.0	0.202894	0.002000	3.946300
C(Cd) [ng/m3]	1408.0	0.109996	0.000600	3.410452
C(Pb) [ng/m3]	1408.0	4.079849	0.020000	110.663833
C(Mn) [ng/m3]	1408.0	2.206155	0.080753	35.153316
C(Fe) [ng/m3]	1408.0	133.716974	4.213409	1775.940455
C(Cu) [ng/m3]	1408.0	4.322492	0.010361	199.466936
C(Zn) [ng/m3]	1408.0	9.367998	0.043000	162.055147



ZG3

	count	mean	min	max
V [m3]	1461.0	638.524066	30.380000	720.000000
C(As) [ng/m3]	1408.0	0.202894	0.002000	3.946300
C(Cd) [ng/m3]	1408.0	0.109996	0.000600	3.410452
C(Pb) [ng/m3]	1408.0	4.079849	0.020000	110.663833
C(Mn) [ng/m3]	1408.0	2.206155	0.080753	35.153316
C(Fe) [ng/m3]	1408.0	133.716974	4.213409	1775.940455
C(Cu) [ng/m3]	1408.0	4.322492	0.010361	199.466936
C(Zn) [ng/m3]	1408.0	9.367998	0.043000	162.055147



Questions

Thank you!