

Auckland Council Air Quality and Transport Overview

Transport Knowledge Hub



C40 air quality workshop overview

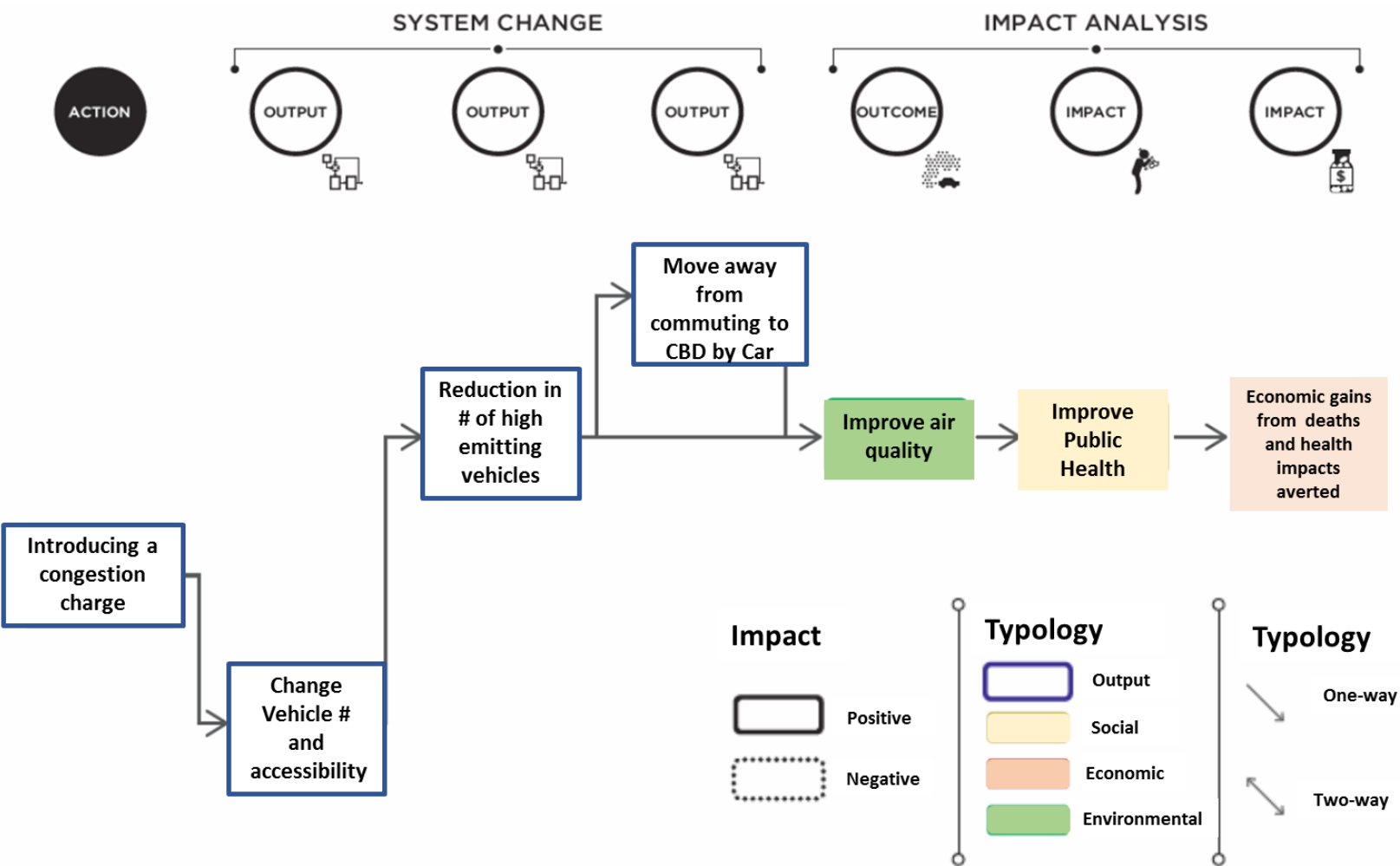
Reason for workshop

- Improve international collaboration on actions to improve air quality in C40 cities.
- Offer expert technical guidance on measuring and quantifying the impact of various climate action on air quality and health.
- Provide access to international experts in the fields of population health, air pollution monitoring and City design.

No	City	Action Group
1	Amman	BRT
2	Auckland	Congestion charge
3	Chennai	Electric buses
4	Dar es Salaam	BRT
5	Dubai	Green/Electric mobility
6	Durban	Industrial efficiency
7	HCMC	Bus upgrading programme
8	Jakarta	Mandatory vehicles testing + LEZ
9	Chengdu	LEZ (Private car restriction)
10	Rome	LEZ (car restriction)
11	Venice	Car restriction



C40 air quality workshop overview



Defining The System Change for Auckland CBD





City Context / Action Area

- Defining the Intervention area: Auckland CBD
- Population number and make up
- Air pollutant concentration baselines (background / citywide / intervention area)
- Health concentration response functions (ADHB)
- Traffic data (Auckland Forecasting Centre data)





Results to be
presented
soon



Trends in Auckland's NO_2 / PM_{10} / $\text{PM}_{2.5}$

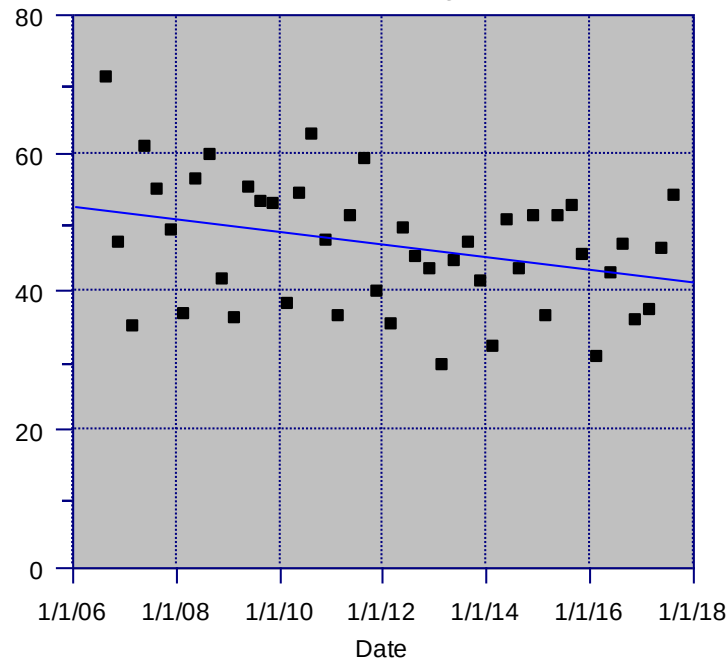
- The Mann-Kendall test is a non-parametric test for identifying trends in time series data. Seasonalised for this analysis
- $P = 0.05$ or lower, which corresponds to a 95% confidence level and greater. The MK-Stat Represented here as Z strength and direction of trend.
- 3 times ranges considered for this analysis
 - 2006 - 2017
 - 2012 – 2017
 - 2015 – 2017 (non seasonalised)



Queen Street NO₂

2006 –2017

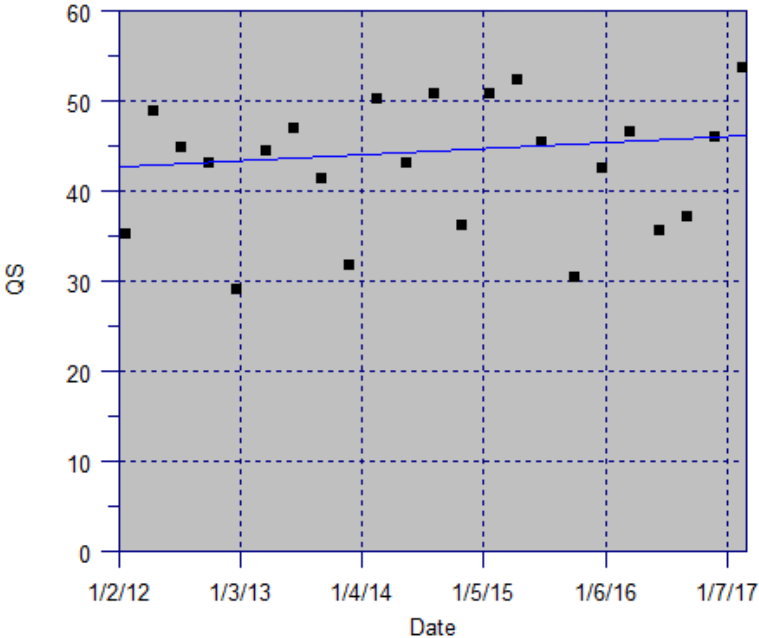
Trend for QS



Z	P	Median Sen slope (annual)	Percent annual change
-2.06	0.04	-0.90	-1.93

2012 –2017

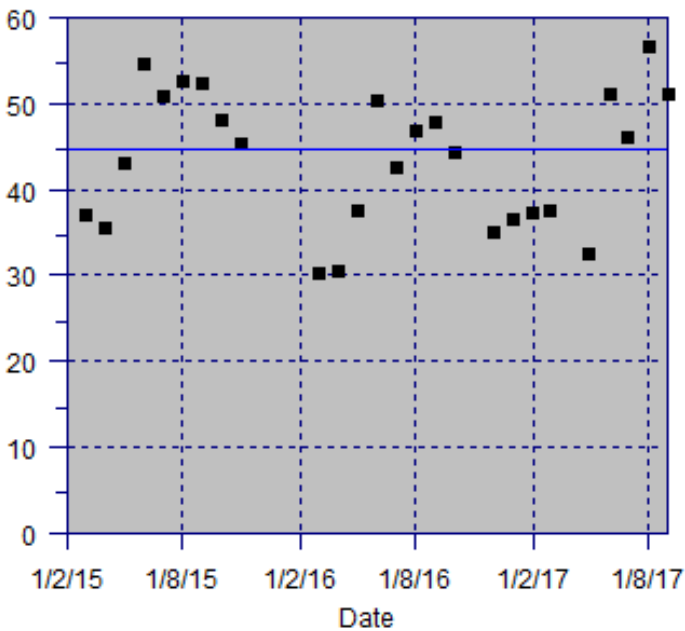
Trend for QS



Z	P	Median Sen slope (annual)	Percent annual change
-0.61	0.54	-0.50	-2.39

2015 –2017

Trend for QS

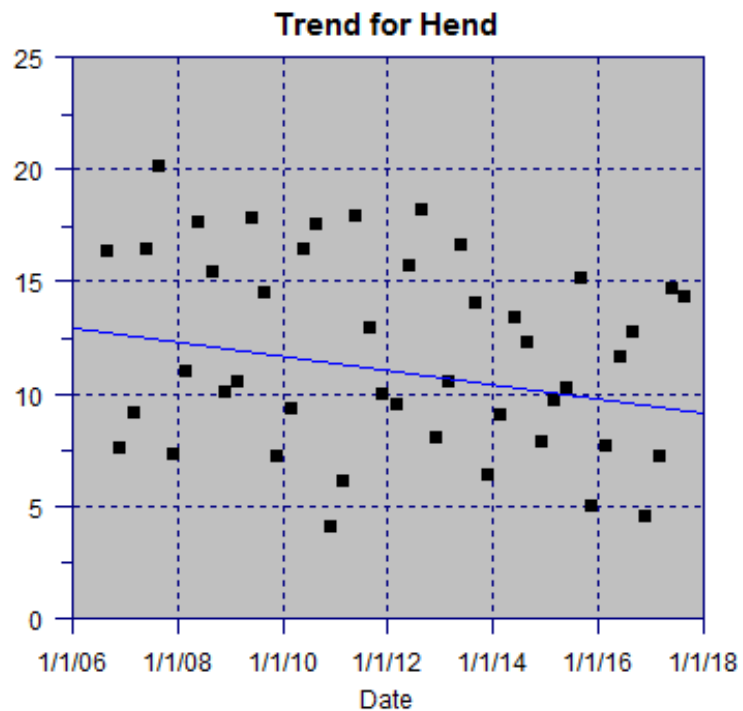


Z	P	Median Sen slope (annual)	Percent annual change
0.02	0.98	0.05	0.12



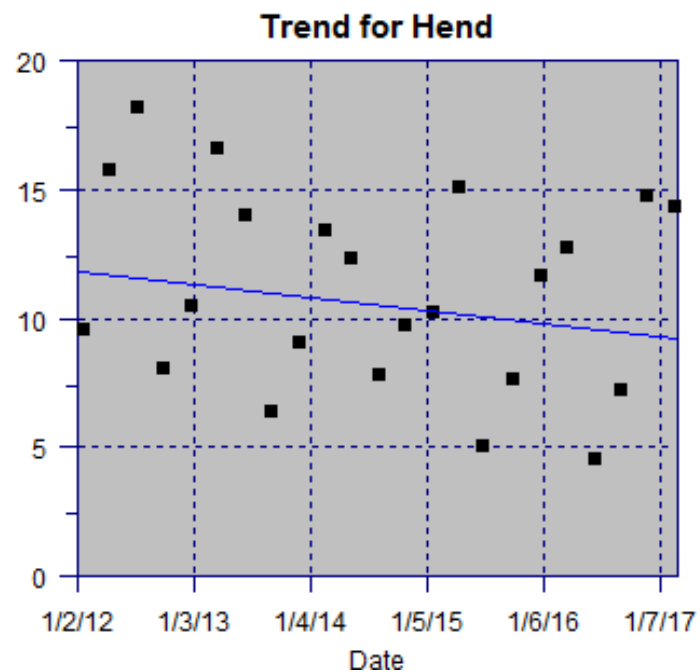
Henderson NO₂

2006–2017



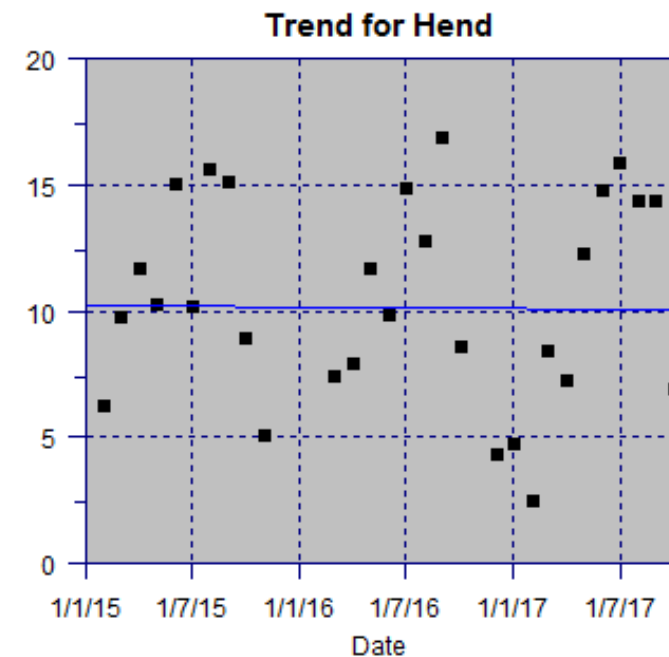
Z	P	Median Sen slope (annual)	Percent annual change
-1.41	0.16	-0.31	-2.82

2012–2017



Z	P	Median Sen slope (annual)	Percent annual change
-0.95	0.34	-0.46	-4.40

2015–2017



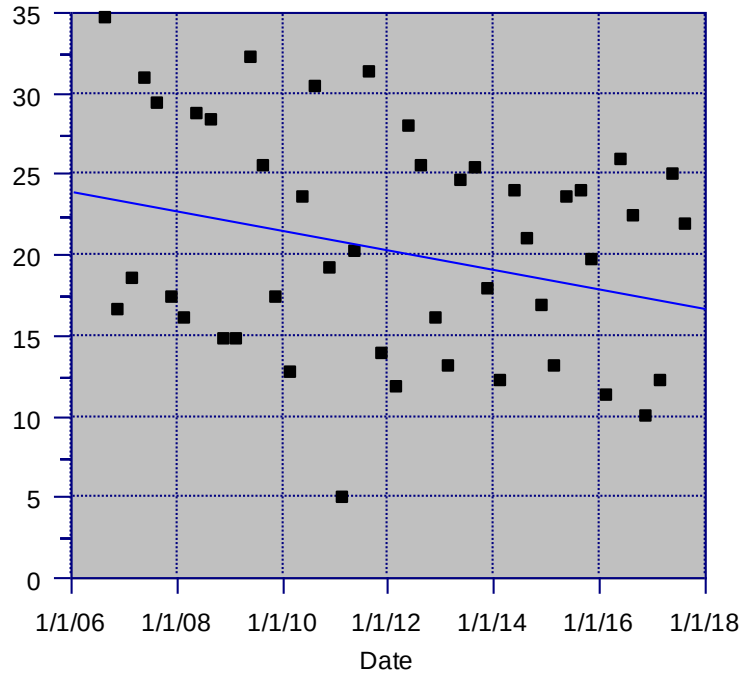
Z	P	Median Sen slope (annual)	Percent annual change
-0.02	0.99	-0.05	-0.54



Takapuna NO₂

2006 – 2017

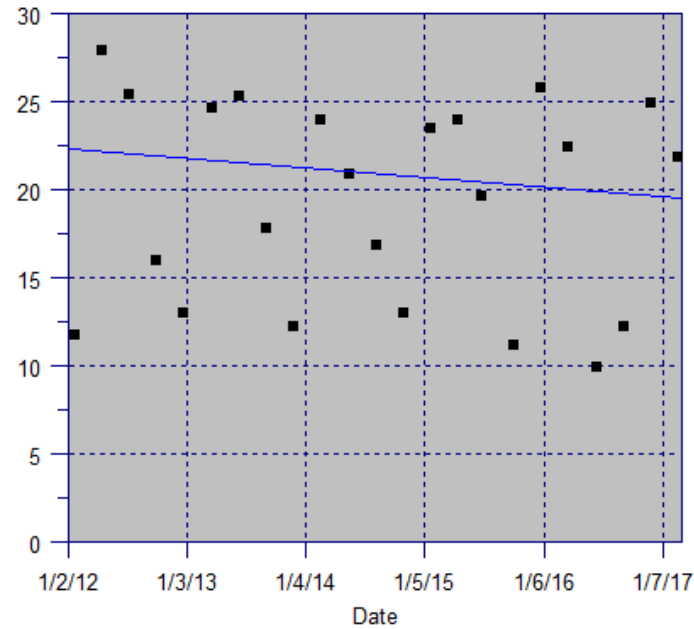
Trend for Taka



Z	P	Median Sen slope (annual)	Percent annual change
-1.75	0.08	-0.60	-2.97

2012 – 2017

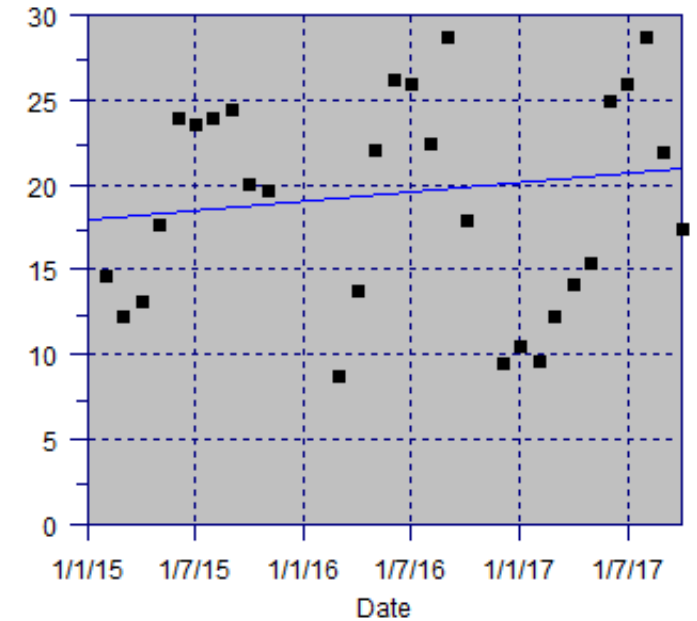
Trend for Taka



Z	P	Median Sen slope (annual)	Percent annual change
-0.61	0.54	-0.50	-2.39

2015 – 2017

Trend for Taka



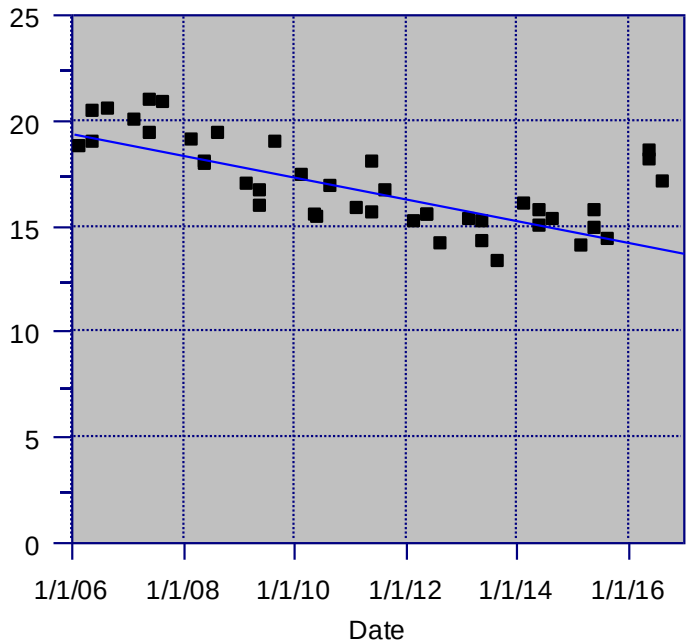
Z	P	Median Sen slope (annual)	Percent annual change
0.77	0.44	1.07	5.48



Queen Street: PM_{10}

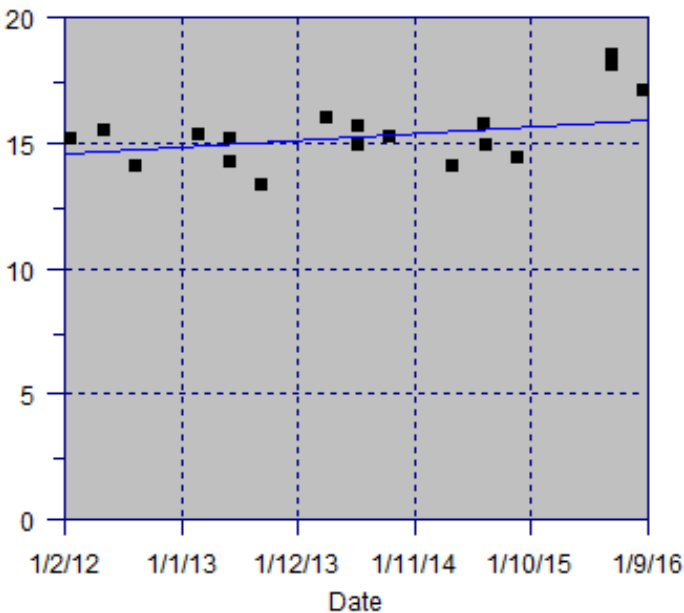
Gravimetric sampling

Trend for QS 10



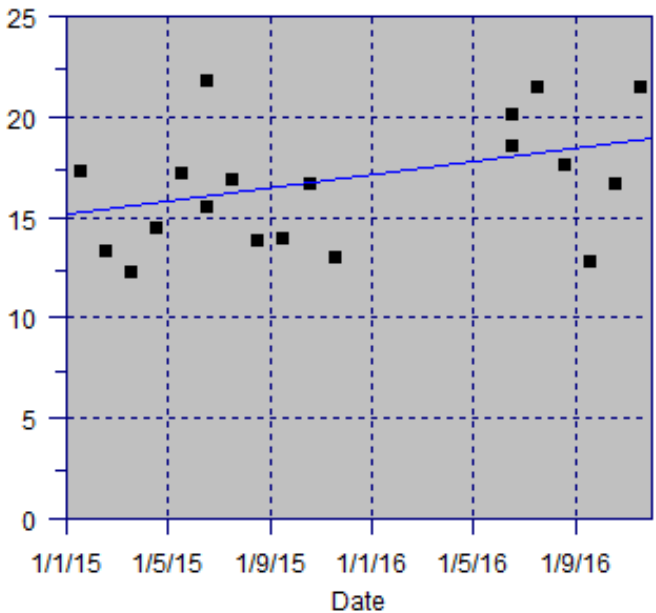
Z	P	Median Sen slope (annual)	Percent annual change
-4.95	0.00	-0.52	-3.13

Trend for QS 10



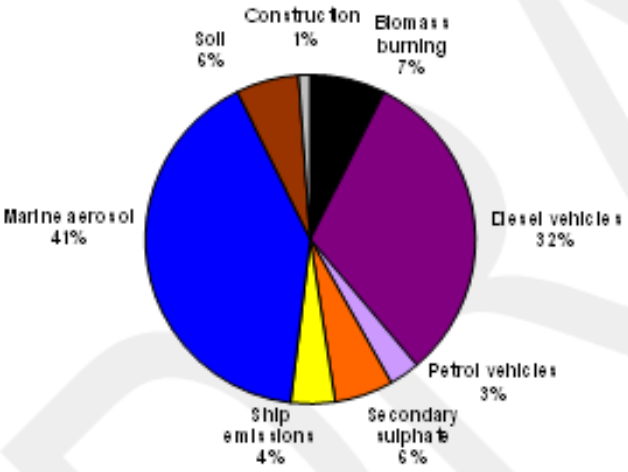
Z	P	Median Sen slope (annual)	Percent annual change
1.23	0.22	0.29	1.93

Trend for QS 10



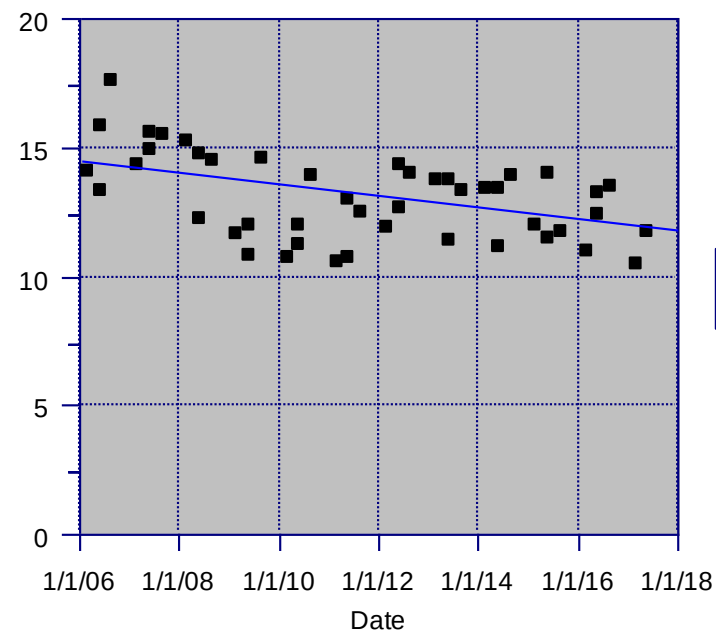
Variance	Z	P	Median Sen slope (annual)	Percent annual change
815.00	1.12	0.26	1.97	11.87

Queen Street average $PM_{10} = 18 \mu g m^{-3}$



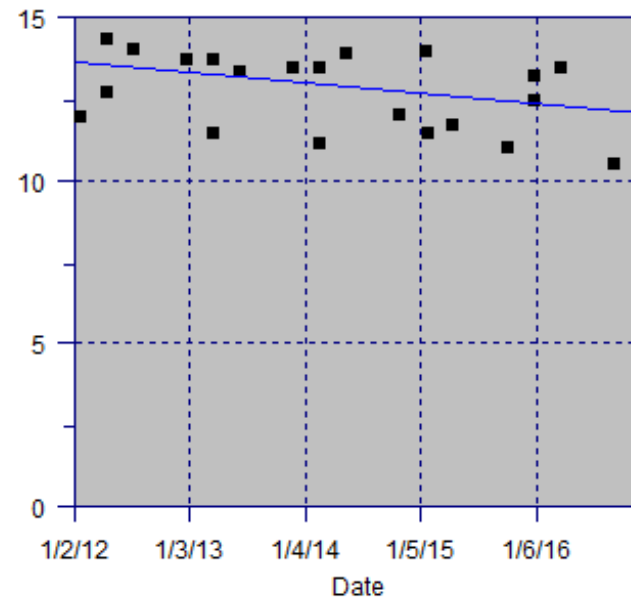
Henderson: PM10

Trend for Hend 10



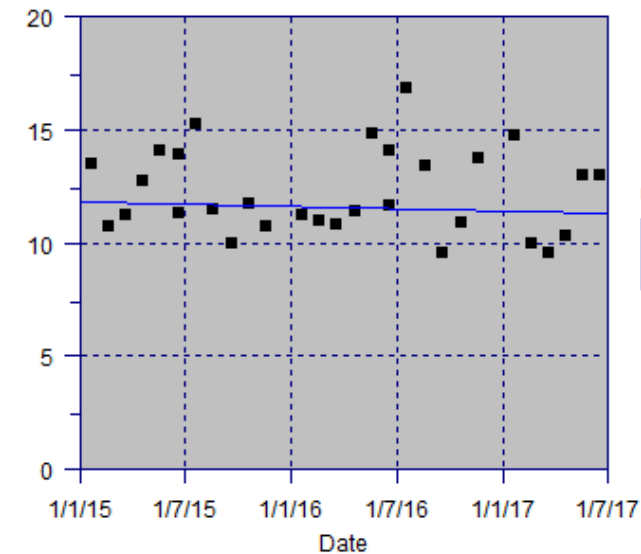
Z	P	Median Sen slope (annual)	Percent annual change
-3.12	0.00	-0.22	-1.70

Trend for Hend 10



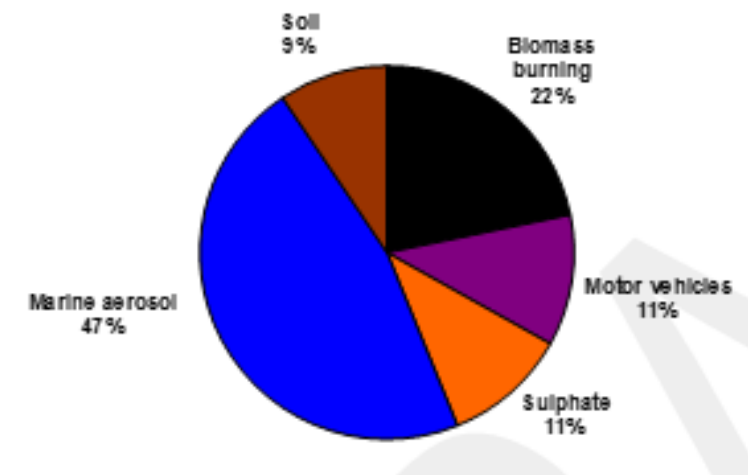
Z	P	Median Sen slope (annual)	Percent annual change
-0.95	0.34	-0.46	-4.40

Trend for Hend 10



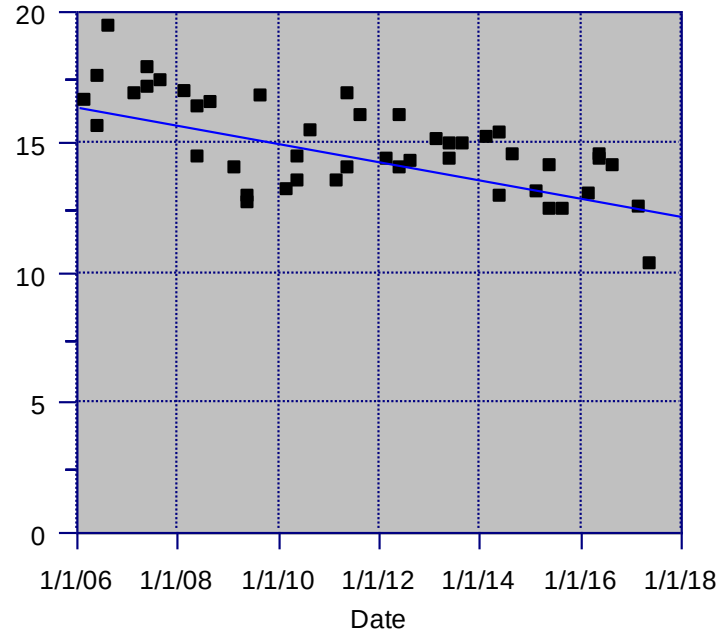
Z	P	Median Sen slope (annual)	Percent annual change
-0.41	0.68	-0.21	-1.86

Average $PM_{10} = 14 \mu g m^{-3}$

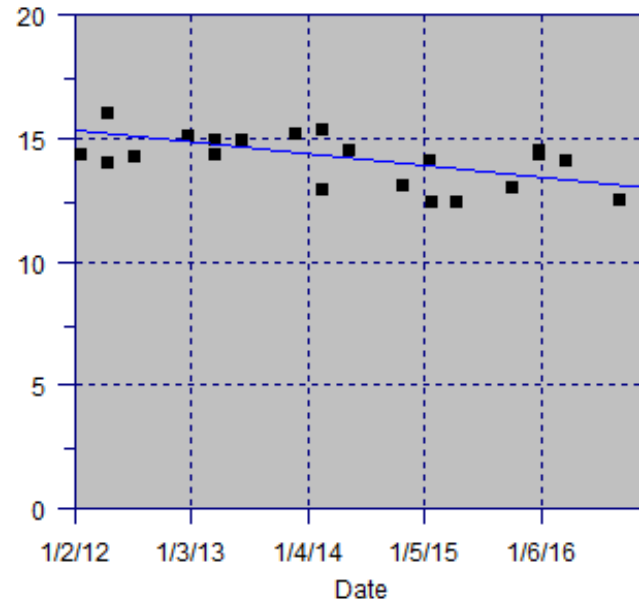


Takapuna PM₁₀

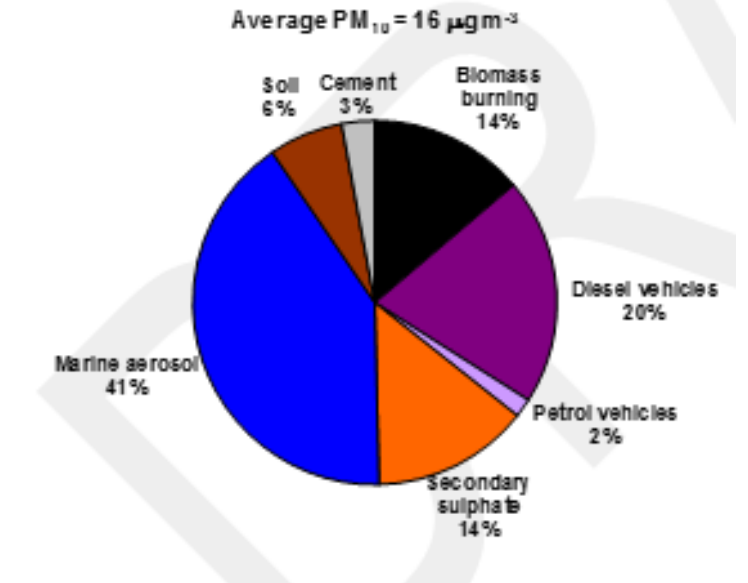
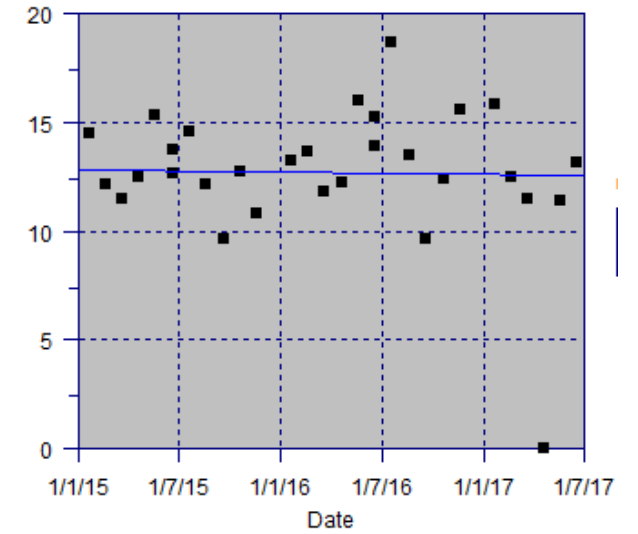
Trend for Taka 10



Trend for Taka 10

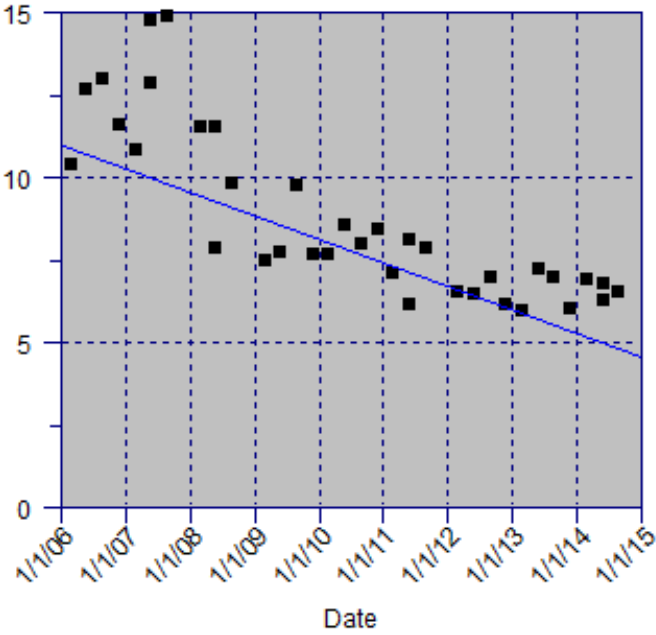


Trend for Taka 10



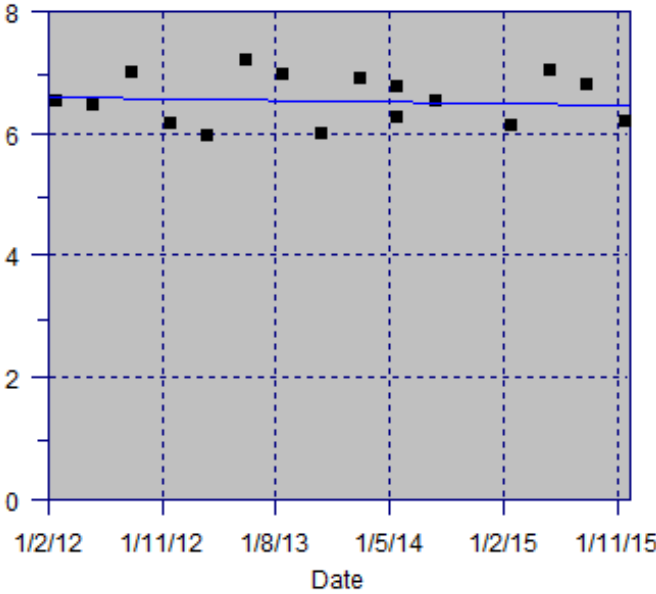
Queen Street: $PM_{2.5}$

Trend for QS 2.5



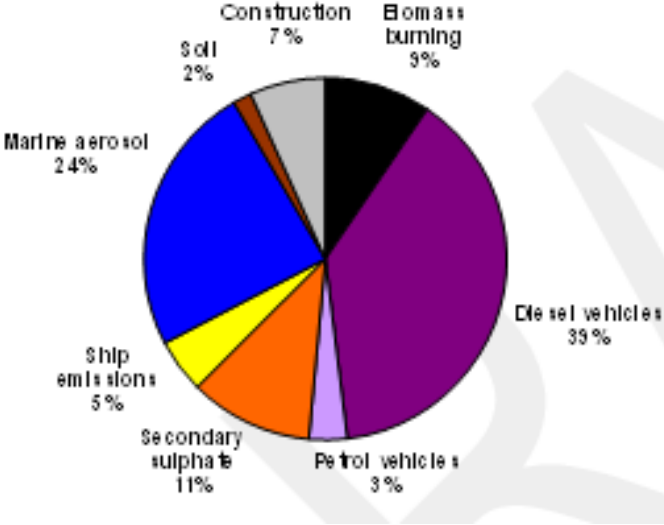
Z	P	Median Sen slope (annual)	Percent annual change
-5.68	0.00	-0.71	-9.15

Trend for QS 2.5



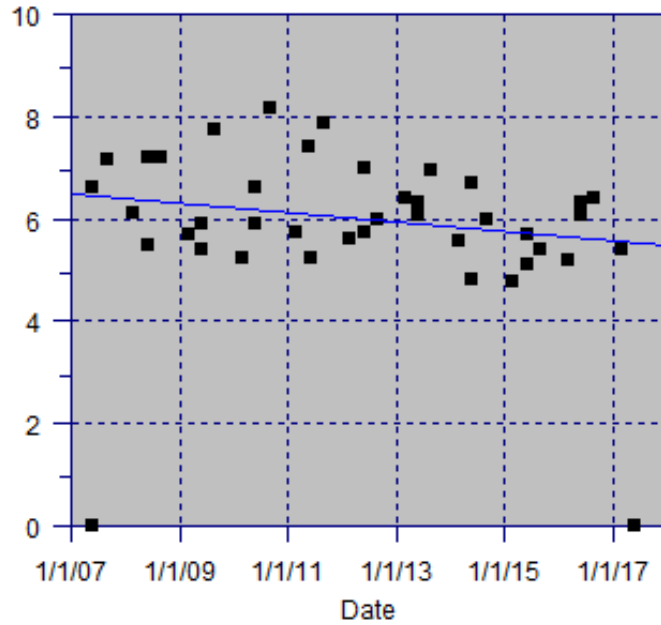
Z	P	Median Sen slope (annual)	Percent annual change
-0.18	0.86	-0.03	-0.46

Queen Street average $PM_{2.5} = 9.5 \mu g m^{-3}$



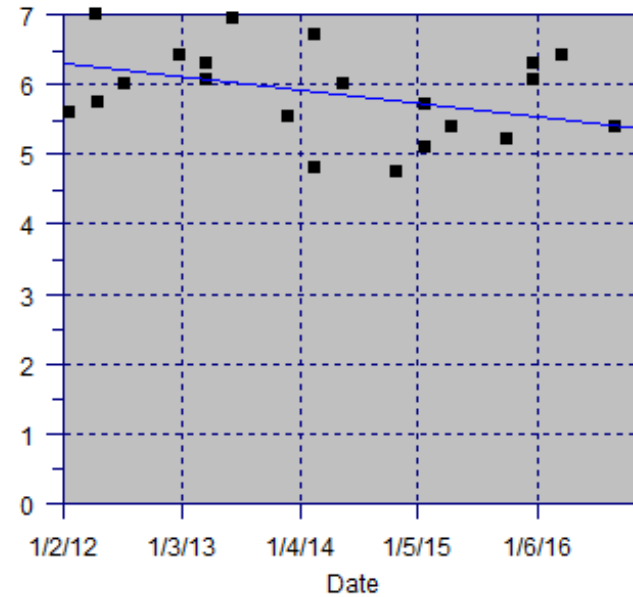
Takapuna: PM_{2.5}

Trend for Taka 2.5



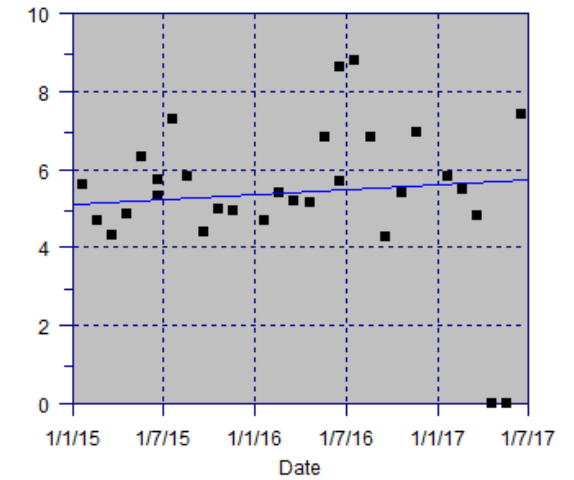
Z	P	Median Sen slope (annual)	Percent annual change
-1.74	0.08	-0.09	-1.54

Trend for Taka 2.5



Z	P	Median Sen slope (annual)	Percent annual change
-1.47	0.14	-0.17	-2.93

Trend for Taka 2.5



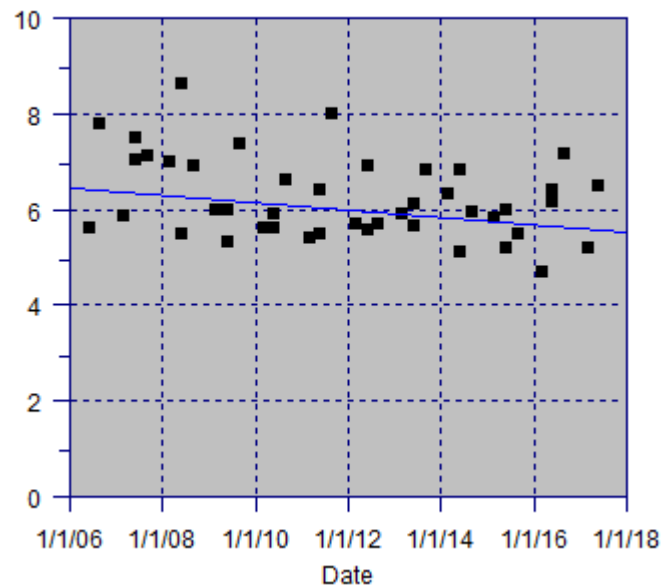
Z	P	Median Sen slope (annual)	Percent annual change
0.55	0.58	0.25	4.63

Average PM_{2.5} = 7.0 µg m⁻³



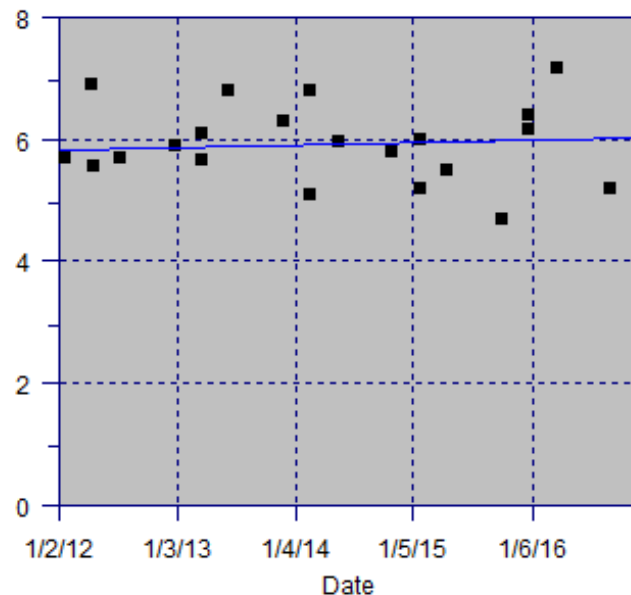
Penrose: $PM_{2.5}$

Trend for Penr 2.5



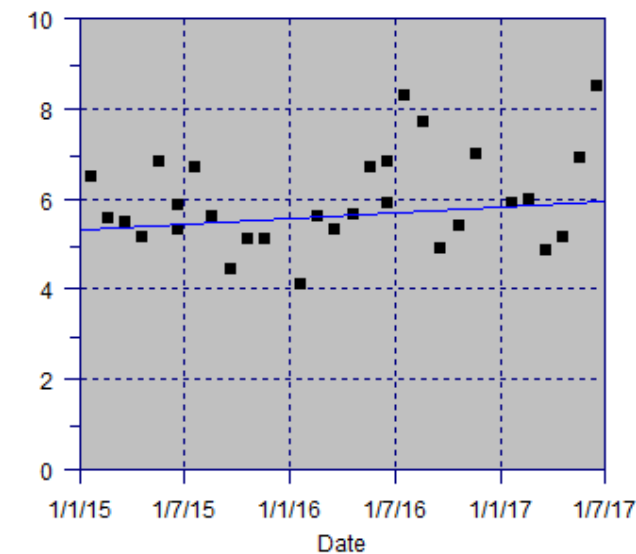
Z	P	Median Sen slope (annual)	Percent annual change
-1.70	0.09	-0.08	-1.26

Trend for Penr 2.5

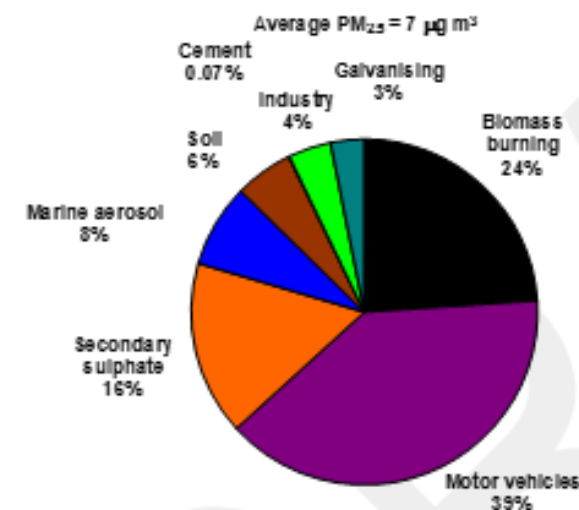


Z	P	Median Sen slope (annual)	Percent annual change
0.23	0.82	0.03	0.59

Trend for Penr 2.5



Z	P	Median Sen slope (annual)	Percent annual change
1.30	0.19	0.26	4.63

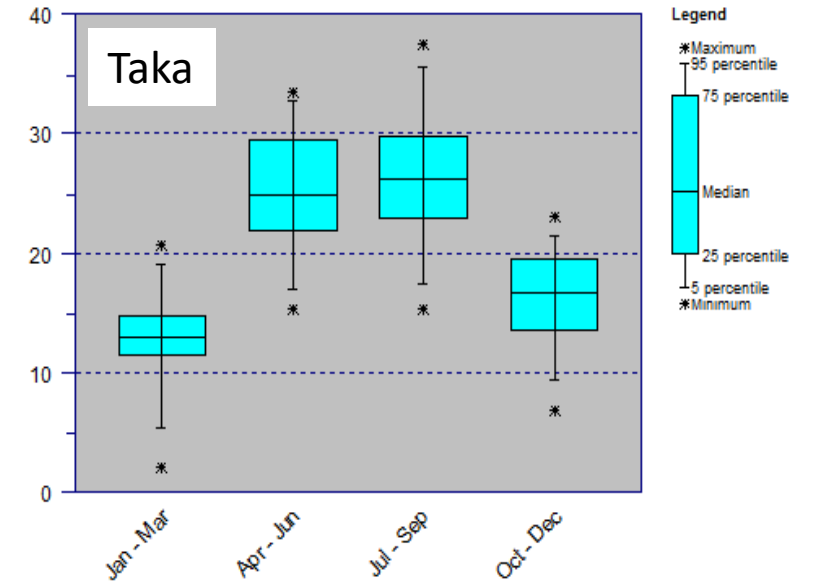
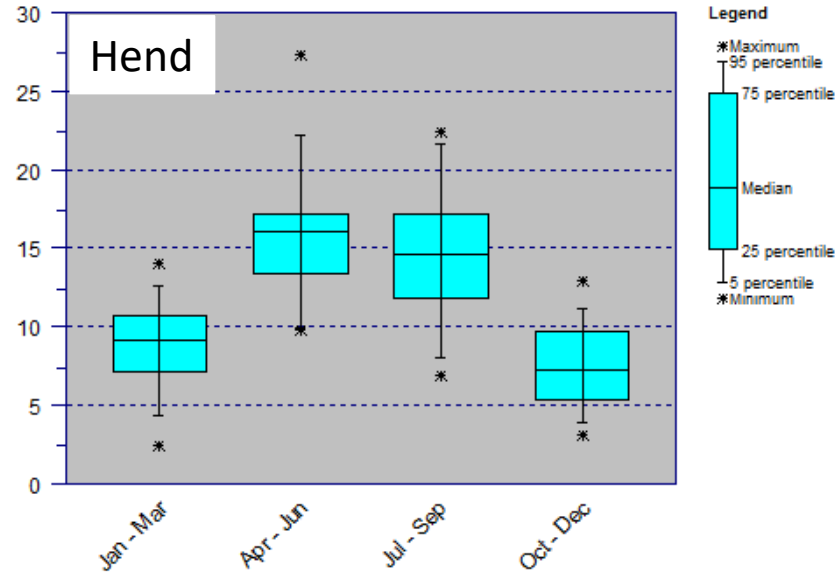
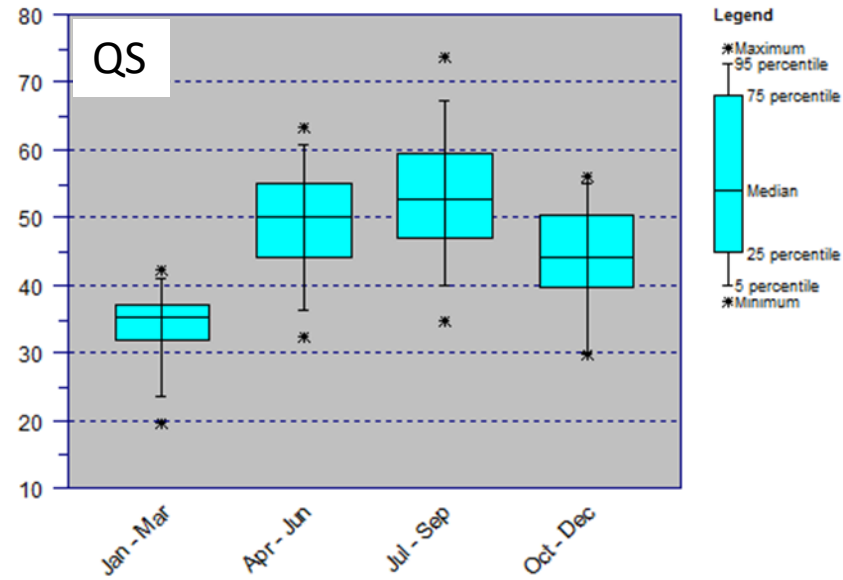


Any Questions?



Seasonal Boxplots NO₂

2006-2017



Seasonal Boxplots PM

2006-2017

