

**Supporting materials:**

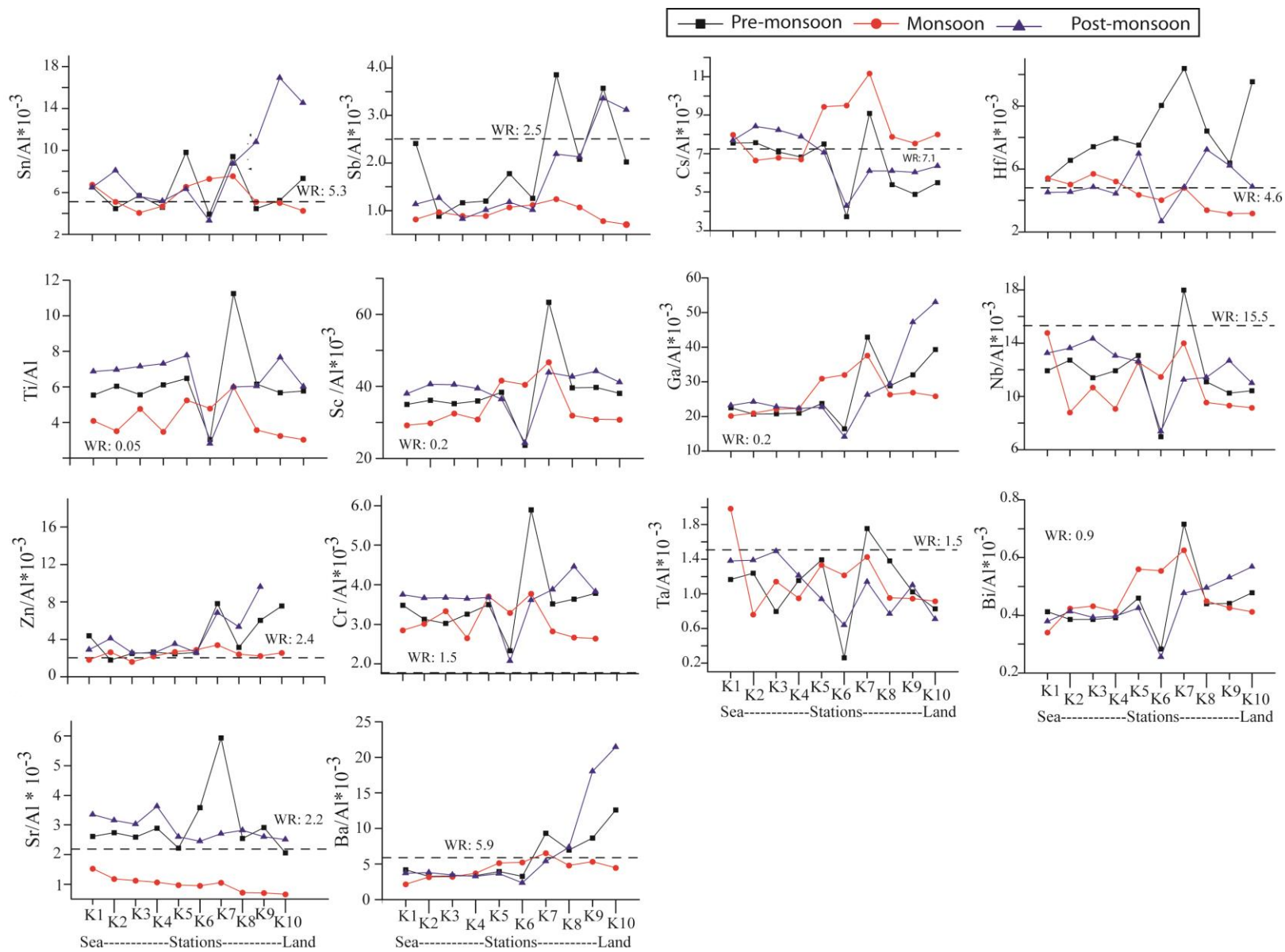
**Spatial and temporal distribution of metals in suspended particulate matter of the Kali estuary, India**

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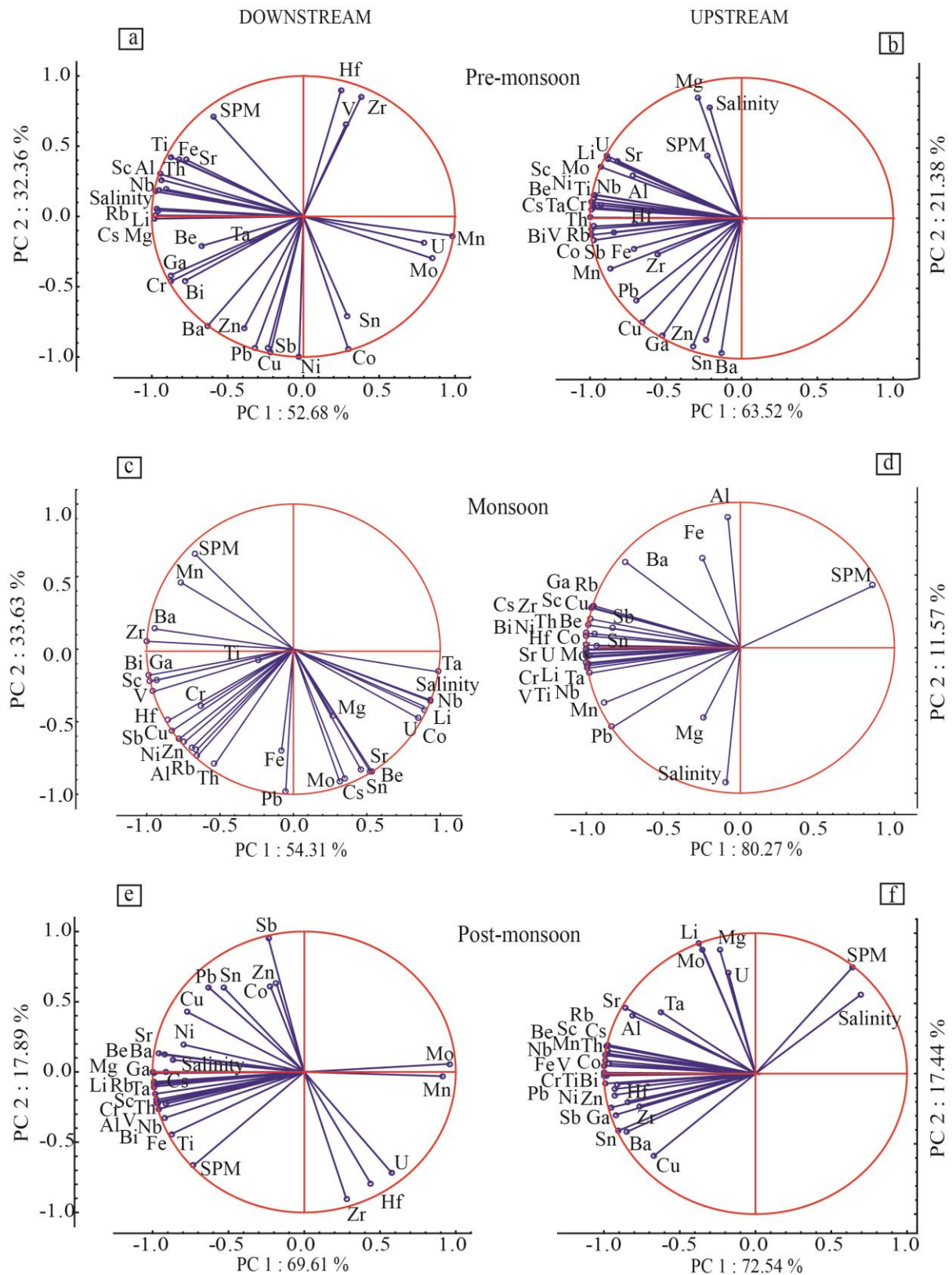
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**SM Figure 5:** Variation in element/Al ratios in surface SPM along the Kali estuary during Pre monsoon, monsoon and post monsoon . The dotted line with WR are element/Al values calculated from average world river SPM values (Viers et al., 2009) for respective element. WR is given where the values does not fit on the axis.



**SM Figure 6:** Principal Component Analysis of SPM content, Salinity and elemental composition of the surface SPM (a) Downstream estuary (stations K1 to K5) pre monsoon, (b) Upstream estuary (stations K6-K9) pre monsoon, (c) Downstream estuary monsoon, (d) Upstream estuary monsoon, (e) Downstream estuary post monsoon, (f) Upstream estuary post monsoon.



SM Table 4 : Enrichment factor of Kali estuarine surface SPM elements

Pre-Monsoon	Fe	Mn	Ti	Mg	Cu	Zn	Pb	Cr	Ni	Co	Zr	Rb	Sr	Ba	Li	Sc	V	Ga	Nb	Mo	Sn	Sb	Cs	Hf	Ta	Bi	Th	U
k1	1.3	3.5	1.6	1.8	1.6	1.8	2.1	2.3	2.1	1.9	1.2	1.2	1.2	0.7	14.1	1.7	1.3	1.1	0.8	1.0	1.2	1.0	1.1	1.2	0.8	0.4	1.0	1.0
k2	1.3	1.6	1.7	1.8	1.2	0.8	0.6	2.1	1.5	1.2	1.4	1.2	1.3	0.5	14.8	1.7	1.3	1.0	0.8	0.6	0.8	0.3	1.1	1.4	0.8	0.4	1.1	1.1
k3	1.3	5.5	1.6	1.8	1.3	1.0	1.0	2.0	1.6	1.5	1.7	1.2	1.2	0.6	13.3	1.7	1.3	1.0	0.7	1.1	1.1	0.5	1.0	1.6	0.5	0.4	1.0	1.2
k4	1.4	10.3	1.8	1.7	1.4	1.1	0.7	2.2	1.9	1.7	1.8	1.2	1.3	0.6	12.2	1.7	1.5	1.0	0.8	1.8	0.9	0.5	1.0	1.7	0.8	0.4	1.0	1.8
k5	1.5	14.3	1.8	1.8	1.6	1.0	1.3	2.3	2.3	2.1	1.7	1.3	1.0	0.7	13.9	1.8	1.6	1.1	0.8	3.9	1.9	0.7	1.1	1.6	0.9	0.5	1.0	3.5
k6	1.5	12.3	1.1	1.9	1.2	1.1	0.8	1.6	2.2	1.4	2.5	0.7	1.6	0.5	7.4	1.1	1.0	0.8	0.5	3.3	0.7	0.5	0.5	2.2	0.2	0.3	0.5	3.9
k7	1.8	49.3	2.9	1.6	3.3	3.3	2.0	4.0	8.8	4.8	2.9	1.7	2.7	1.6	14.3	3.0	3.2	2.1	1.2	10.7	1.8	1.5	1.3	2.7	1.2	0.8	1.4	12.5
k8	1.8	31.1	1.8	1.4	2.5	1.3	0.8	2.4	5.5	2.9	2.0	1.0	1.2	1.2	7.5	1.9	2.1	1.4	0.7	5.9	0.8	0.8	0.8	1.8	0.9	0.5	0.9	6.5
k9	1.8	41.4	1.7	1.4	2.8	2.5	0.8	2.4	3.2	3.1	1.5	1.0	1.3	1.4	6.7	1.9	2.0	1.5	0.7	3.5	1.0	1.4	0.7	1.4	0.7	0.5	0.8	5.2
k10	2.0	29.0	1.7	1.0	3.1	3.2	1.2	2.5	3.5	2.9	2.7	1.0	0.9	2.1	5.3	1.8	2.1	1.9	0.7	2.2	1.4	0.8	0.8	2.5	0.6	0.5	0.8	1.9
k11	1.9	41.8	1.3	0.9	4.0	5.9	2.1	2.1	3.9	3.2	3.0	1.1	1.0	4.3	4.6	1.5	1.9	3.0	0.6	2.1	4.3	1.0	0.7	2.3	0.5	0.5	0.8	1.2
Min	1.3	1.6	1.1	0.9	1.2	0.8	0.6	1.6	1.5	1.2	1.2	0.7	0.9	0.5	4.6	1.1	1.0	0.8	0.5	0.6	0.7	0.3	0.5	1.2	0.2	0.3	0.5	1.0
Max	2.0	49.3	2.9	1.9	4.0	5.9	2.1	4.0	8.8	4.8	3.0	1.7	2.7	4.3	14.8	3.0	3.2	3.0	1.2	10.7	4.3	1.5	1.3	2.7	1.2	0.8	1.4	12.5
Avg	1.6	21.8	1.7	1.6	2.2	2.1	1.2	2.4	3.3	2.4	2.0	1.1	1.3	1.3	10.4	1.8	1.8	1.4	0.7	3.3	1.5	0.8	0.9	1.9	0.7	0.5	0.9	3.6
Monsoon																												
k1	1.3	2.1	1.3	0.9	1.2	0.8	0.7	1.9	1.6	1.8	1.2	1.2	0.7	0.4	12.9	1.4	1.5	1.0	1.0	1.2	1.3	0.3	1.1	1.2	1.3	0.4	0.9	2.6
k2	1.2	2.3	1.2	0.8	1.4	1.1	0.6	2.0	2.1	1.3	1.1	1.2	0.5	0.5	6.9	1.4	1.5	1.0	0.6	1.0	1.0	0.4	0.9	1.1	0.5	0.5	0.9	1.2
k3	1.3	3.0	1.5	0.9	1.3	0.7	0.5	2.2	1.8	1.5	1.3	1.2	0.5	0.5	8.2	1.6	1.7	1.1	0.7	0.9	0.8	0.4	1.0	1.2	0.8	0.5	0.9	1.4
k4	1.1	2.4	1.2	0.7	1.2	0.9	0.5	1.8	1.6	1.2	1.2	1.2	0.5	0.6	6.1	1.5	1.6	1.1	0.6	0.7	0.9	0.4	0.9	1.1	0.6	0.5	0.9	0.8
k5	1.1	2.5	1.6	0.6	1.7	1.1	0.8	2.5	2.2	1.7	0.9	1.7	0.4	0.9	8.0	2.0	2.1	1.5	0.8	0.9	1.2	0.4	1.3	1.0	0.9	0.6	1.2	1.0
k6	1.1	1.8	1.5	0.5	1.7	1.2	0.6	2.2	2.1	1.5	0.9	1.7	0.4	0.9	7.4	1.9	2.1	1.5	0.7	0.9	1.4	0.4	1.3	0.9	0.8	0.6	1.1	1.0
k7	1.1	2.4	1.7	0.5	2.0	1.4	0.7	2.5	2.6	1.8	1.1	2.0	0.5	1.1	8.5	2.2	2.4	1.8	0.9	1.0	1.4	0.5	1.6	1.0	1.0	0.7	1.4	1.2
k8	1.1	1.5	1.2	0.5	1.4	1.0	0.4	1.9	2.0	1.2	0.7	1.4	0.3	0.8	5.9	1.5	1.7	1.3	0.6	0.7	1.0	0.4	1.1	0.7	0.6	0.5	1.0	0.8
k9	1.1	1.4	1.1	0.5	1.4	0.9	0.4	1.8	1.6	1.2	0.7	1.4	0.3	0.9	5.8	1.5	1.6	1.3	0.6	0.7	0.9	0.3	1.1	0.7	0.6	0.5	0.9	0.7
k10	1.0	0.8	1.1	0.5	1.2	1.1	0.4	1.8	1.6	1.1	0.7	1.5	0.3	0.8	6.0	1.5	1.6	1.2	0.6	0.6	0.8	0.3	1.1	0.7	0.6	0.4	0.9	0.7
Min	1.0	0.8	1.1	0.5	1.2	0.7	0.4	1.8	1.6	1.1	0.7	1.2	0.3	0.4	5.8	1.4	1.5	1.0	0.6	0.6	0.8	0.3	0.9	0.7	0.5	0.4	0.9	0.7
Max	1.3	3.0	1.7	0.9	2.0	1.4	0.8	2.5	2.6	1.8	1.3	2.0	0.7	1.1	12.9	2.2	2.4	1.8	1.0	1.2	1.4	0.5	1.6	1.2	1.3	0.7	1.4	2.6
Avg	1.1	2.0	1.3	0.6	1.4	1.0	0.6	2.1	1.9	1.4	1.0	1.4	0.5	0.7	7.6	1.7	1.8	1.3	0.7	0.9	1.1	0.4	1.1	1.0	0.8	0.5	1.0	1.1
Post-Monsoon																												
k1	1.3	3.1	1.9	1.8	1.5	1.2	0.7	2.5	2.1	1.7	1.0	1.4	1.5	0.6	14.4	1.8	1.6	1.1	0.9	1.0	1.2	0.5	1.1	1.0	0.9	0.4	1.0	1.1
k2	1.3	3.6	1.9	1.8	1.6	1.7	0.6	2.5	2.1	1.8	1.0	1.5	1.4	0.6	16.0	1.9	1.6	1.2	0.9	1.0	1.5	0.5	1.2	1.0	0.9	0.5	1.0	1.1
k3	1.3	1.8	2.0	1.8	1.3	1.1	0.5	2.5	1.9	1.5	1.1	1.4	1.4	0.6	15.8	1.9	1.5	1.1	0.9	0.7	1.1	0.3	1.2	1.1	1.0	0.4	1.1	1.1
k4	1.4	5.1	2.0	1.7	1.6	1.1	0.5	2.4	2.3	1.8	1.0	1.4	1.7	0.5	14.7	1.9	1.6	1.1	0.8	1.1	1.0	0.4	1.1	1.0	0.8	0.4	1.0	1.2
k5	1.4	9.5	2.1	1.7	1.6	1.5	0.5	2.5	2.1	2.1	1.5	1.3	1.2	0.6	12.6	1.7	1.6	1.1	0.8	1.8	1.2	0.5	1.0	1.5	0.6	0.5	0.9	1.6
k6	1.5	11.9	1.0	1.7	1.3	1.1	0.5	1.4	1.7	1.6	0.6	0.7	1.1	0.4	7.4	1.2	1.1	0.7	0.5	2.8	0.6	0.4	0.6	0.6	0.4	0.3	0.6	1.8
k7	1.7	24.6	1.7	1.5	2.8	2.9	1.4	2.4	3.5	3.0	1.0	1.1	1.2	0.9	8.4	2.1	2.1	1.3	0.7	4.8	1.7	0.9	0.9	1.1	0.8	0.5	0.9	8.7
k8	1.8	24.1	1.7	1.5	2.8	2.2	2.5	2.6	5.4	3.1	1.7	1.1	1.3	1.2	7.6	2.0	2.1	1.4	0.7	3.0	2.0	0.8	0.9	1.6	0.5	0.5	0.9	6.3
k9	2.0	19.5	2.1	1.3	7.4	4.0	1.2	3.0	3.7	3.3	1.3	1.1	1.2	3.0	5.8	2.1	2.3	2.3	0.8	2.1	3.2	1.3	0.8	1.4	0.7	0.6	0.9	1.6
k10	2.0	30.9	1.7	1.1	4.1	7.2	3.0	2.6	5.0	3.3	1.0	1.1	1.2	3.6	5.5	2.0	2.2	2.6	0.7	2.3	2.8	1.2	0.9	1.1	0.5	0.6	0.9	1.6
Min	1.3	1.8	1.0	1.1	1.3	1.1	0.5	1.4	1.7	1.5	0.6	0.7	1.1	0.4	5.5	1.2	1.1	0.7	0.5	0.7	0.6	0.3	0.6	0.6	0.4	0.3	0.6	1.1
Max	2.0	30.9	2.1	1.8	7.4	7.2	3.0	3.0	5.4	3.3	1.7	1.5	1.7	3.6	16.0	2.1	2.3	2.6	0.9	4.8	3.2	1.3	1.2	1.6	1.0	0.6	1.1	8.7
Avg	1.6	13.4	1.8	1.6	2.6	2.4	1.1	2.4	3.0	2.3	1.1	1.2	1.3	1.2	10.8	1.9	1.8	1.4	0.8	2.1	1.6	0.7	1.0	1.1	0.7	0.5	0.9	2.6

