

Supplement of Atmos. Chem. Phys., 19, 1537–1553, 2019
<https://doi.org/10.5194/acp-19-1537-2019-supplement>
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Supplement of

Chemical characterisation of water-soluble ions in atmospheric particulate matter on the east coast of Peninsular Malaysia

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Table S1: Recovery levels of the extracted target ions and associated %RSD_{rec} (n = 3). Procedural blank peak areas for each ion and average blank contribution to field samples over the entire sampling period are also shown.

Ion	% Recovery	%RSD_{rec} (n = 3)	Blank area / $\mu\text{S min}^{-1}$	Average % blank contribution
Cl ⁻	79.5	2.9	3.31×10^{-3}	2.7
NO ₂ ⁻	81.5	3.2	not detected	not detected
NO ₃ ⁻	78.8	5.3	6.19×10^{-3}	7.6
PO ₄ ³⁻	98.2	5.6	2.38×10^{-2}	52.0
SO ₄ ²⁻	80.4	7.9	1.31×10^{-2}	1.0
CH ₃ SO ₃ ⁻	74.5	2.8	not detected	not detected
C ₂ O ₄ ²⁻	82.5	2.9	not detected	not detected
Na ⁺	87.3	6.0	6.51×10^{-1}	53.8
NH ₄ ⁺	80.0	4.6	2.03×10^{-2}	4.9
K ⁺	78.3	5.3	1.31×10^{-2}	12.5
Mg ²⁺	83.3	4.8	3.76×10^{-2}	26.1
Ca ²⁺	123.3	7.6	5.21×10^{-2}	34.0

Table S2: Instrumental parameters and associated errors for the IC.

Ion	RT range / min	LOD / ng	LOQ / ng	%RSD_{ins} (n = 10)	%RSD_{total}
Cl ⁻	4.97 – 5.00	9.61	46.01	7.97	11.2
NO ₂ ⁻	5.86 – 5.89	5.47	25.25	22.36	6.38
NO ₃ ⁻	8.16 – 8.31	8.70	36.18	13.31	6.88
PO ₄ ³⁻	11.23 – 11.38	13.96	42.91	14.40	8.49
SO ₄ ²⁻	13.61 – 13.70	20.98	66.46	8.02	22.6
CH ₃ SO ₃ ⁻	4.50 – 4.53	6.16	29.47	10.26	13.9
C ₂ O ₄ ²⁻	15.72 – 15.85	9.99	144.18	13.58	15.4
Na ⁺	4.10 – 4.14	1.01	2.51	3.32	6.35
NH ₄ ⁺	4.64 – 4.68	0.77	2.96	4.38	9.26
K ⁺	5.71 – 5.77	1.65	2.79	3.55	6.72
Mg ²⁺	8.84 – 9.06	2.11	3.67	4.73	10.6
Ca ²⁺	10.99 – 11.28	0.47	6.14	5.32	14.3

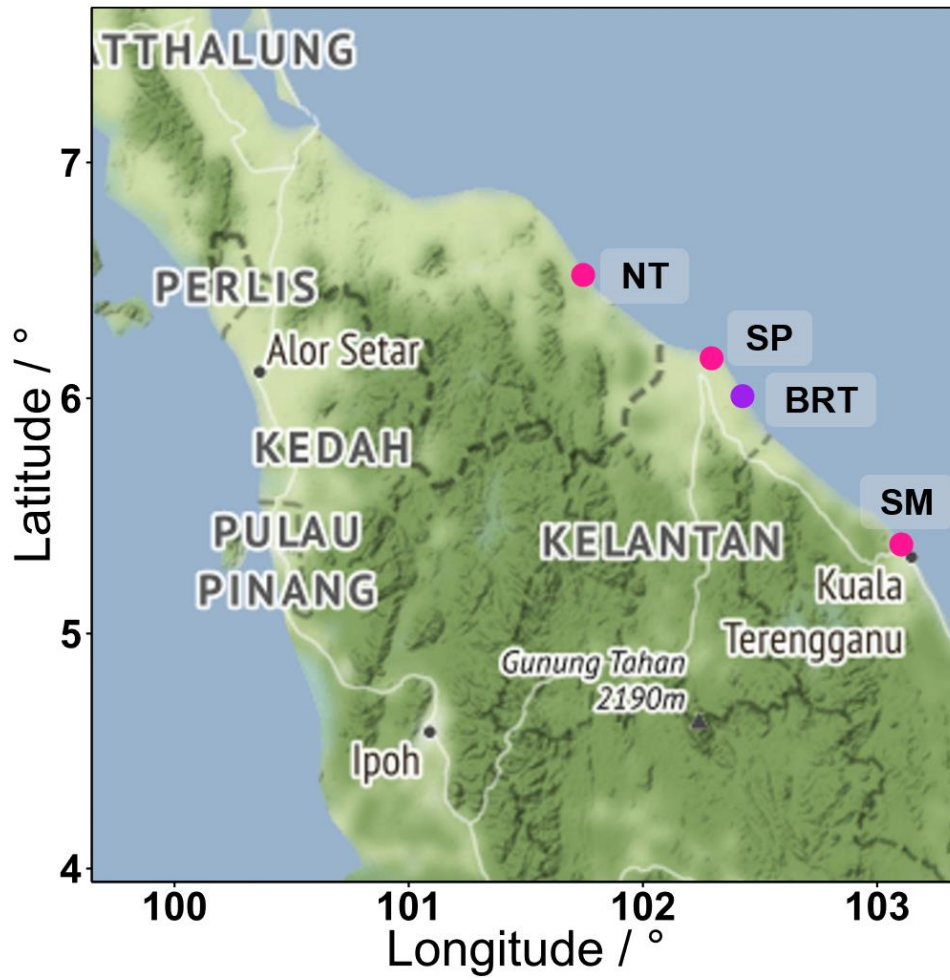


Figure S1: Map to show the Bachok research station (BRT) and the locations of three nearby meteorological stations: Narathiwat airport (NT), Sultan Ismail Petra airport (SP) and Sultan Mahmud airport (SM).

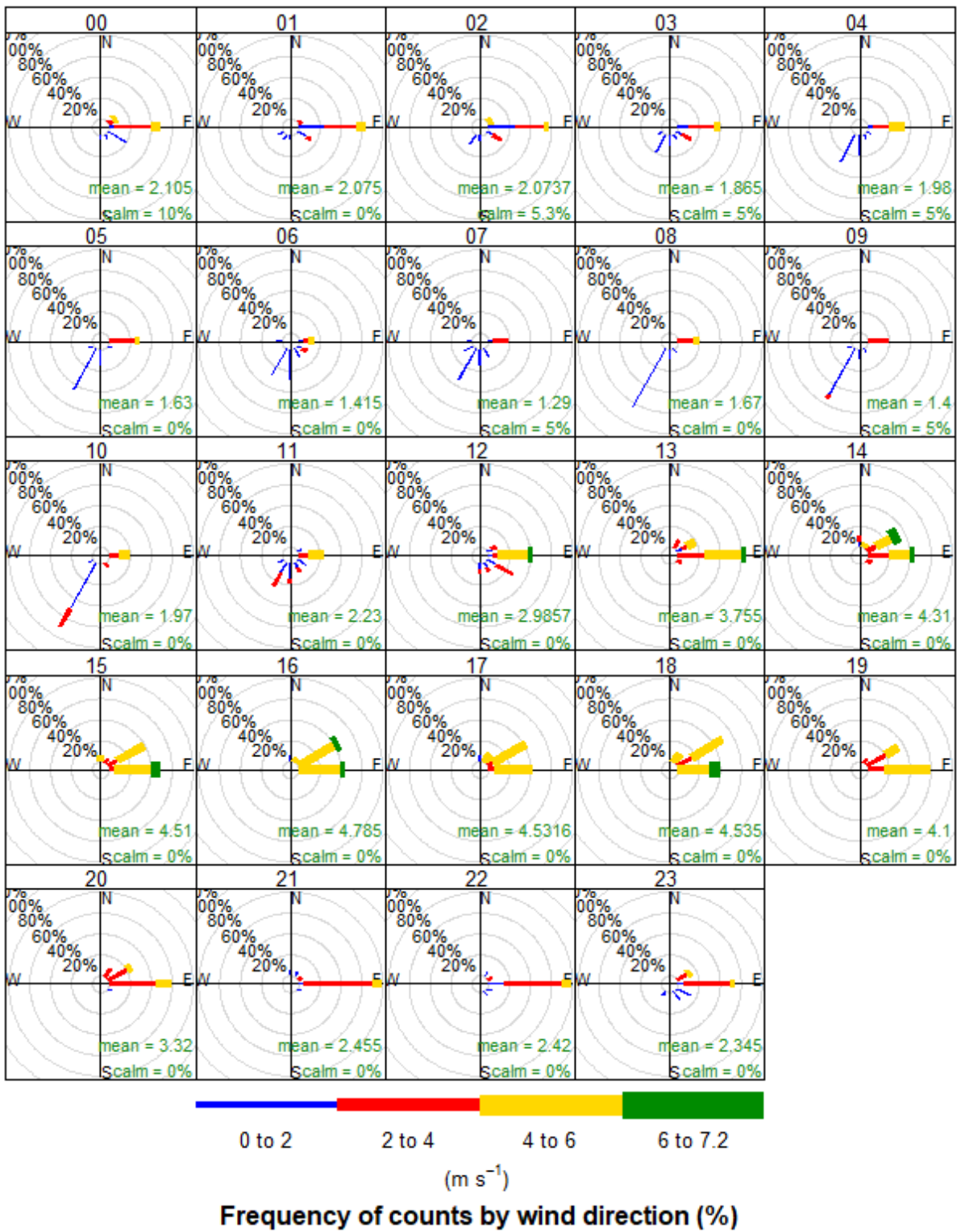


Figure S2: Wind rose plots to show hourly wind speed and wind direction averaged across the measurement campaign (18-01-2014 to 06-02-2014). Plot constructed using the openair package in RStudio (Carslaw and Ropkins, 2012; Carslaw, 2015).

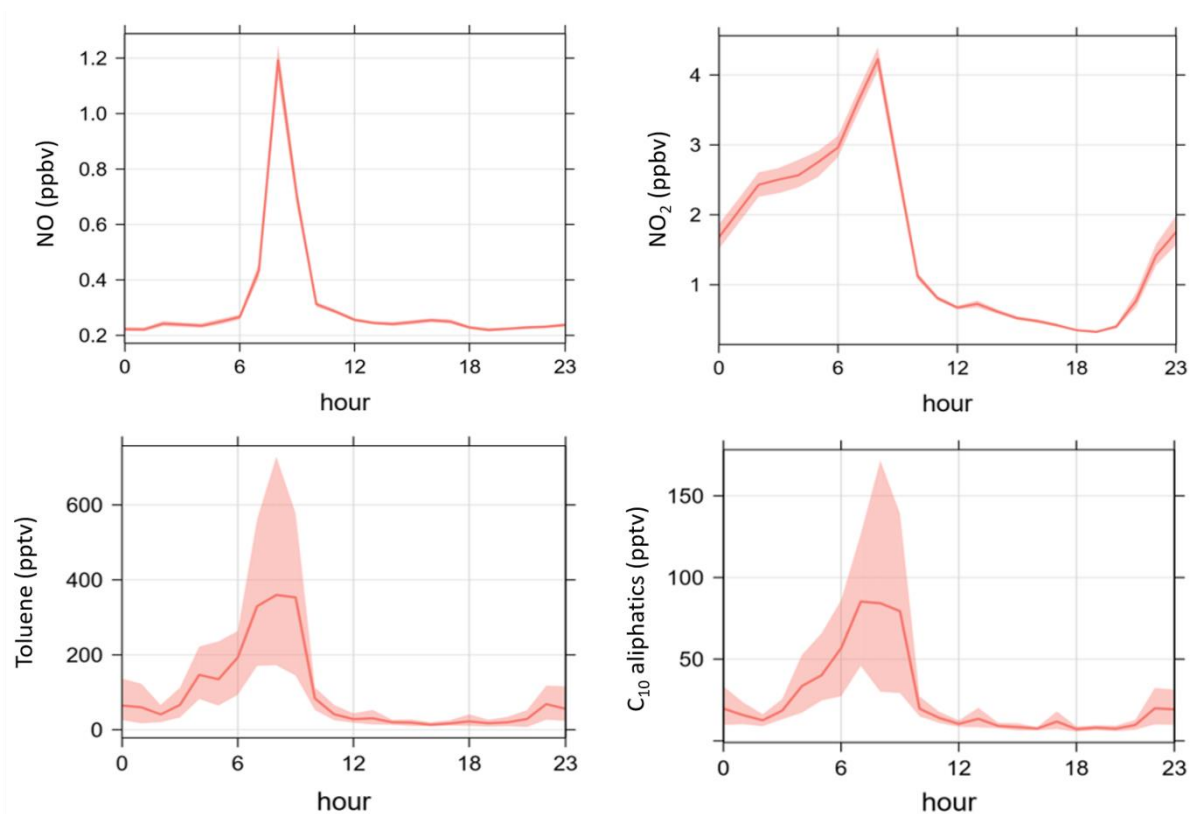


Figure S3: Diurnal profiles of NO, NO₂, toluene and C₁₀ aliphatics measured using GC-GC×GC (Dunmore et al., 2016). The solid line represents the mean daily concentration and the shaded regions show the 95% confidence intervals surrounding the mean. Plot constructed using the openair package in RStudio (Carslaw and Ropkins, 2012; Carslaw, 2015).

Table S3: Average altitude, pressure and SO₄²⁻ concentration of air masses arriving at the Bachok measurement site within each cluster.

Cluster	Mean altitude (m)	Mean pressure (mbar)	Mean SO ₄ ²⁻ (µg m ⁻³)
1	72	989	14.4
2	169	991	8.4
3	501	944	13.8
4	37	1003	8.3
5	1027	895	18.1

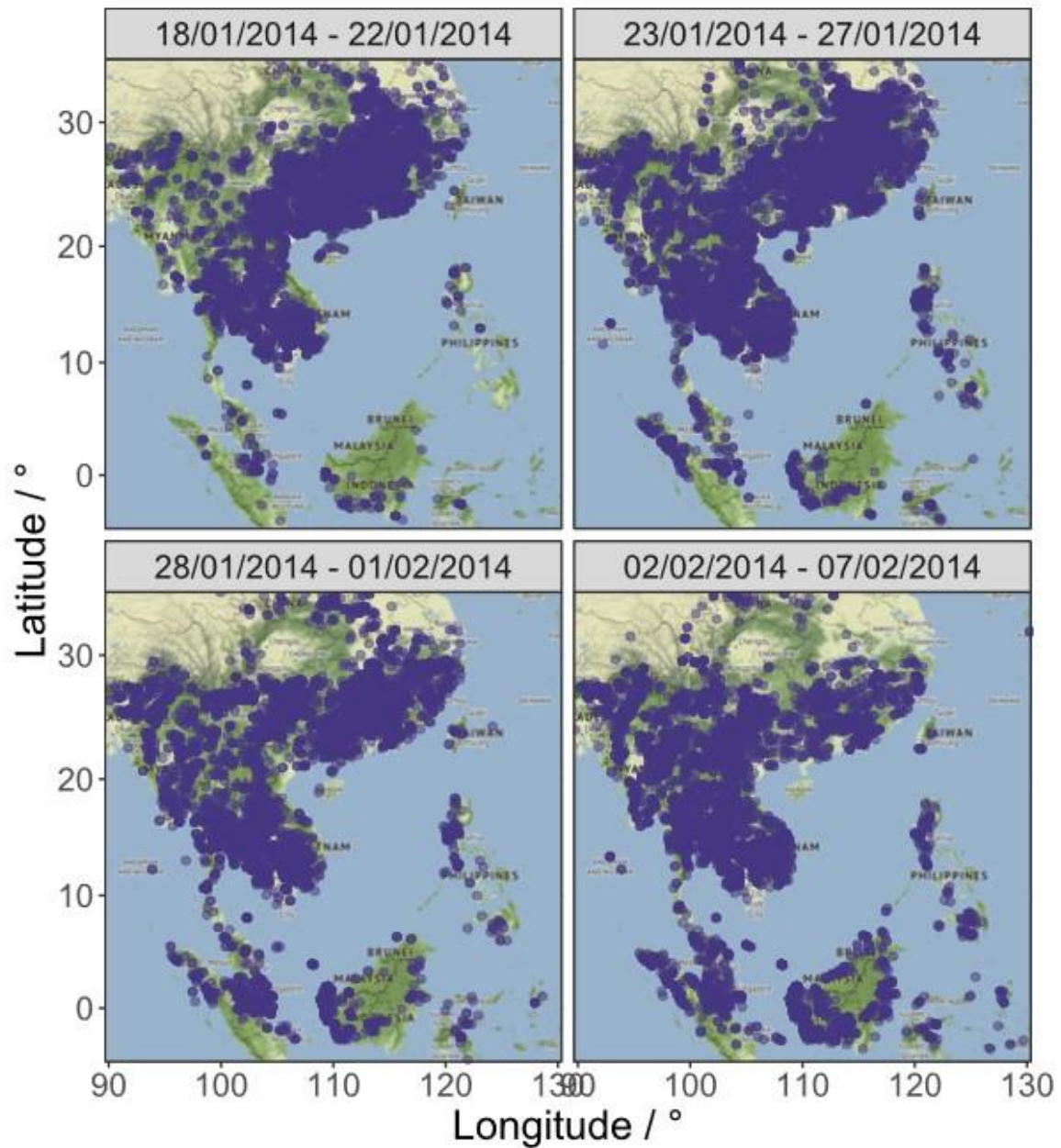


Figure S4: Fire maps for the duration of the Bachok measurement period. Data obtained from the moderate-resolution imaging spectroradiometer (MODIS) instrument on board the NASA Terra satellite (Giglio et al., 2003). Fire maps accessed via the global forest watch website (GFW, 2018).

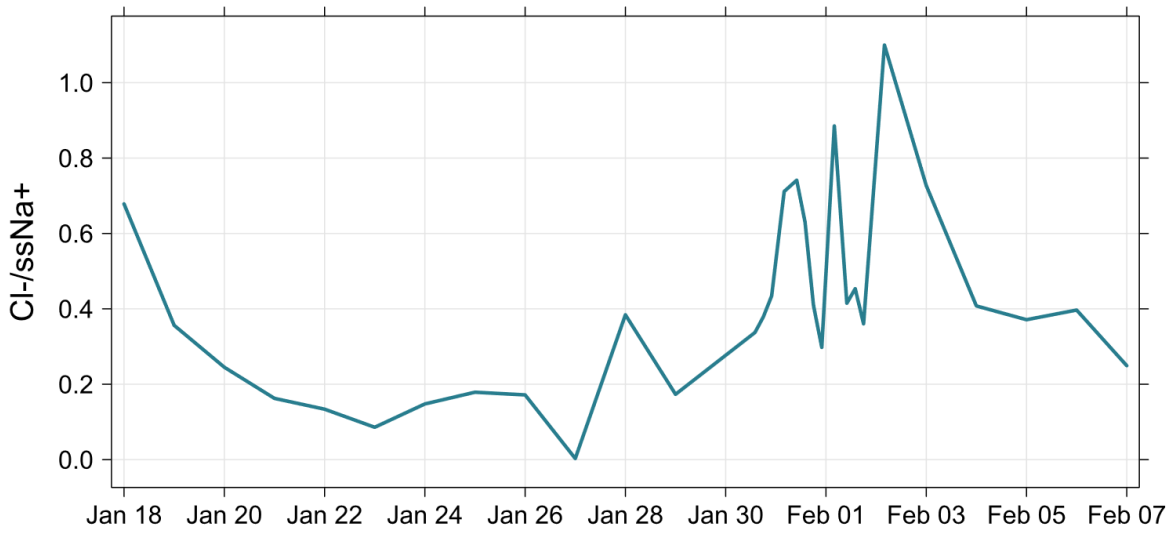


Figure S5: Time series of Cl-/ssNa⁺ molar ratio during the Bachok measurement campaign.

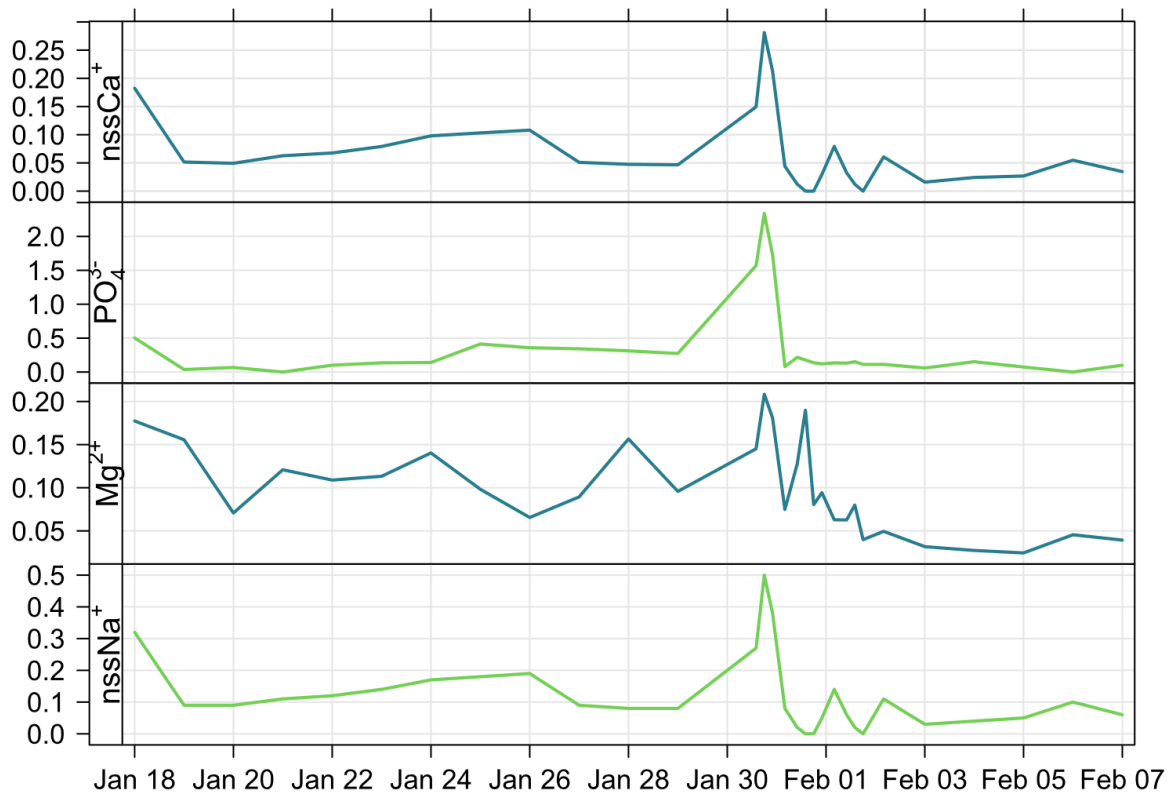


Figure S6: Time series of $nssCa^{2+}$, PO_4^{3-} , Mg^{2+} and $nssNa^+$ concentration ($\mu\text{g m}^{-3}$) during the Bachok measurement period (18-01-2014 to 07-02-2014).

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