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*Supplement of*

## **Cloud water composition during HCCT-2010: Scavenging efficiencies, solute concentrations, and droplet size dependence of inorganic ions and dissolved organic carbon**

**Dominik van Pinxteren et al.**

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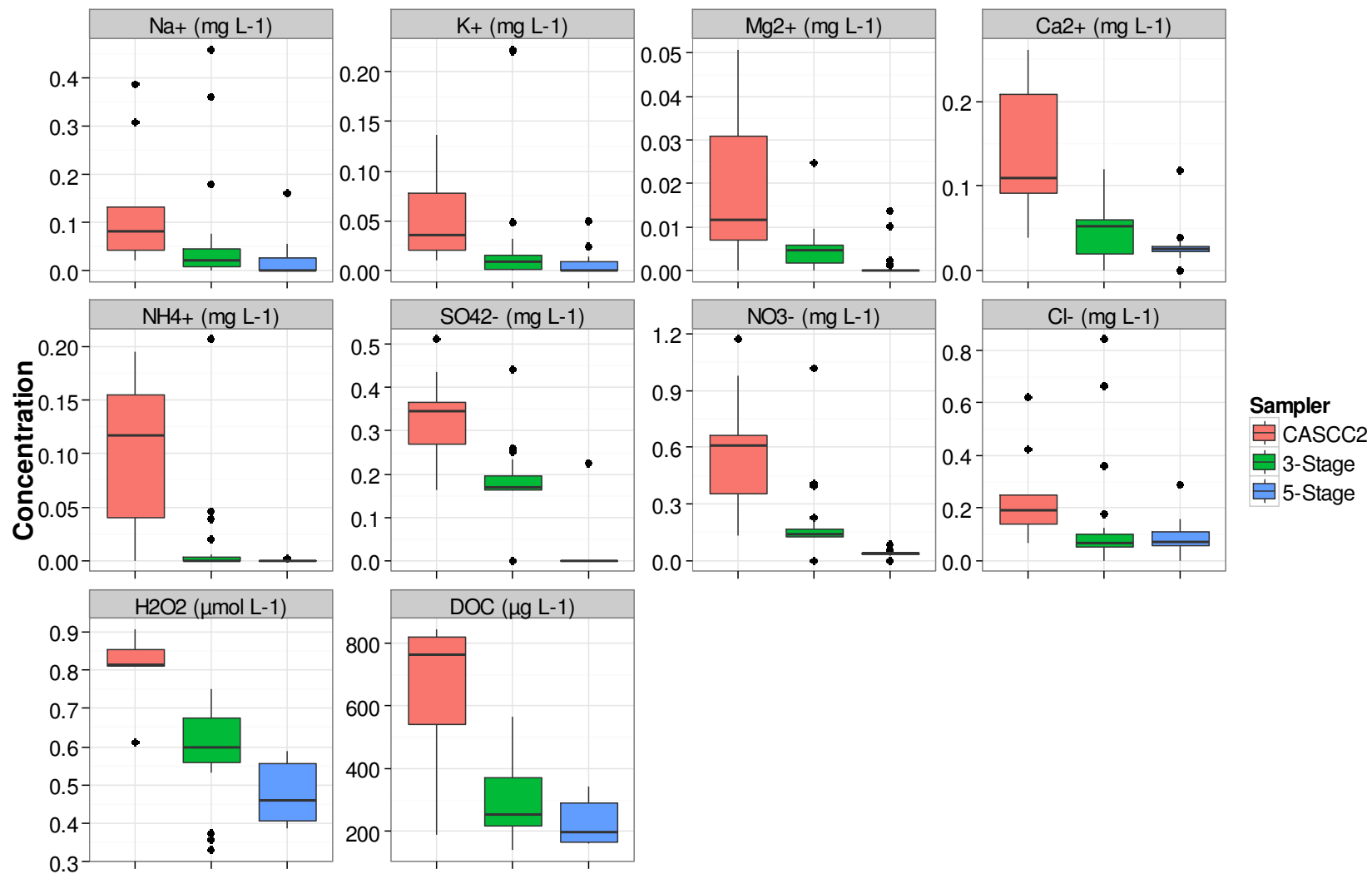


Figure S1: Box-plots of concentration levels of inorganic ions, H<sub>2</sub>O<sub>2</sub>, and DOC in control samples (‘blanks’) from 3 cloud water collectors.

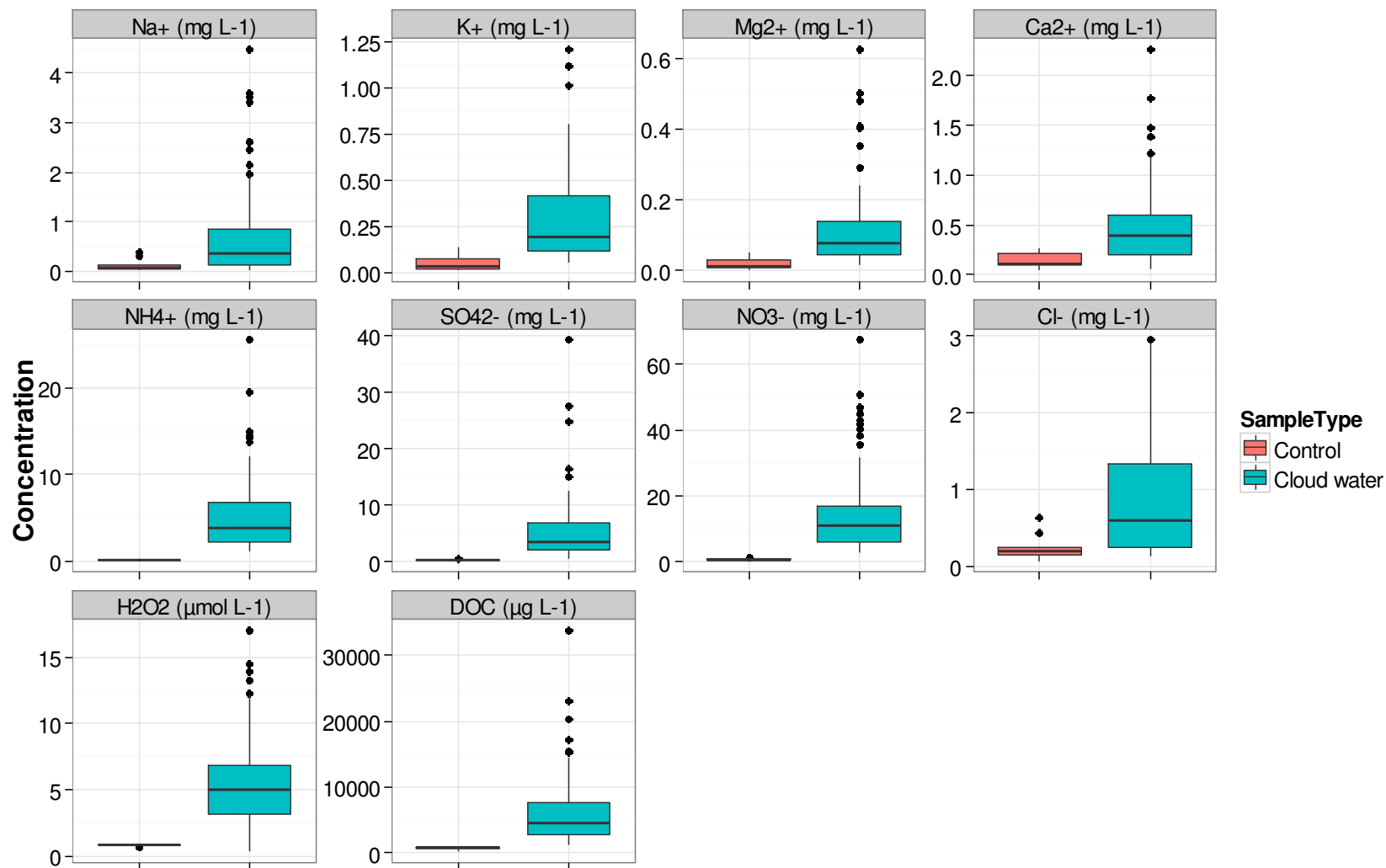


Figure S2: Box-plots of concentration levels of inorganic ions, H<sub>2</sub>O<sub>2</sub>, and DOC in control samples of bulk collector (CASCC2) and bulk cloud water samples.

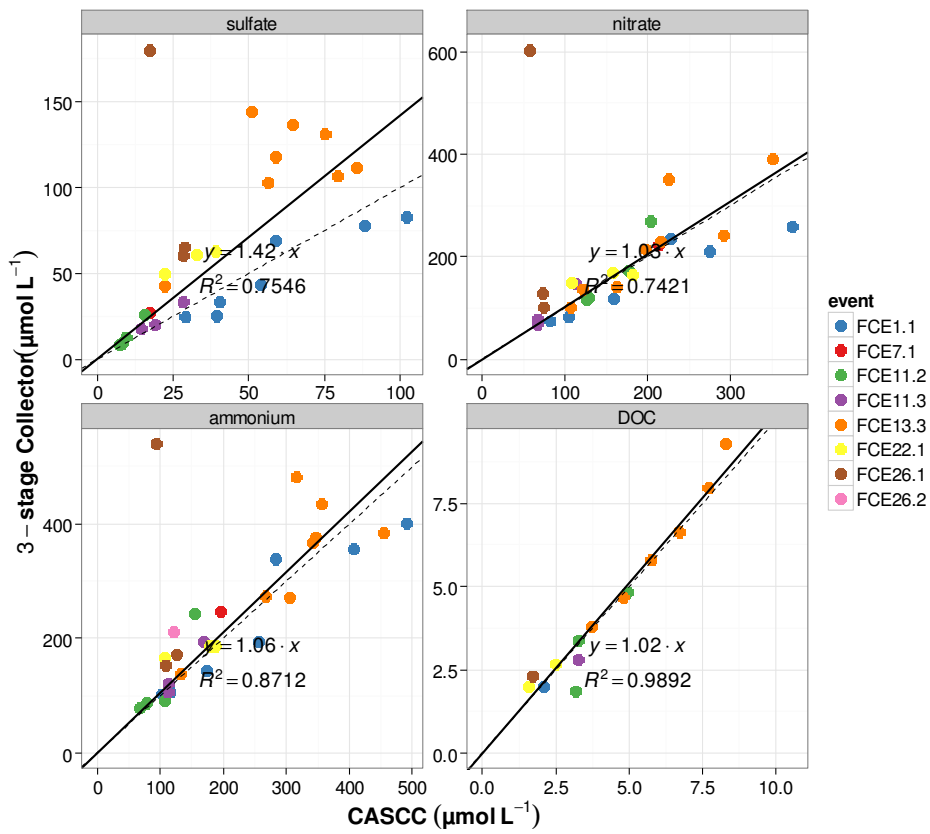


Figure S3: Comparison of solute concentrations of main cloud water constituents between bulk (CASCC) and 3-stage collector (volume-weighted means). Dashed line is 1:1.

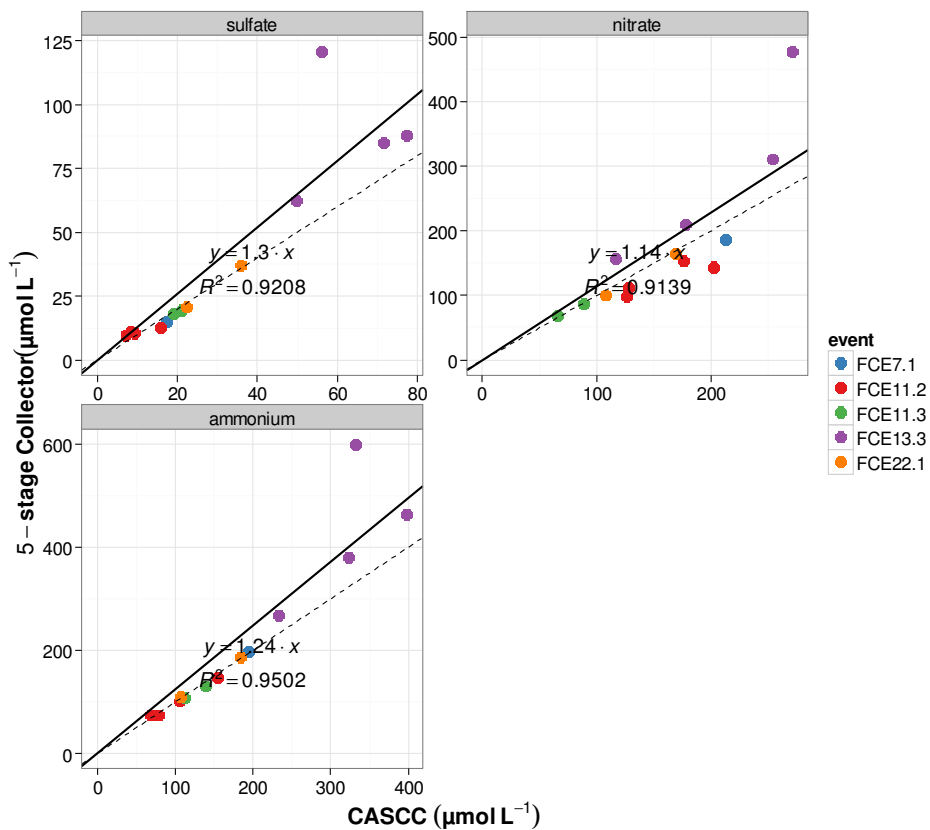


Figure S4: Comparison of solute concentrations of main cloud water constituents between bulk (CASCC) and 5-stage collector (volume-weighted means). Dashed line is 1:1. Note that DOC was not available for most of the 5-stage samples.

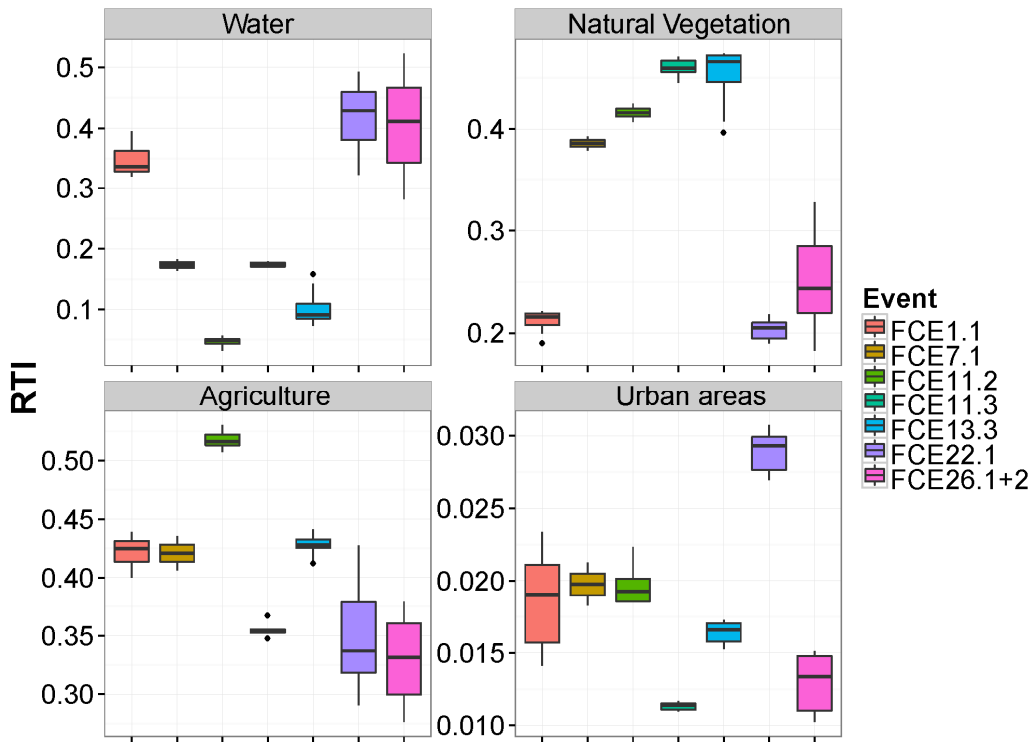


Figure S5: Box-plots of residence time indices (RTIs) for main land cover classes during cloud events.

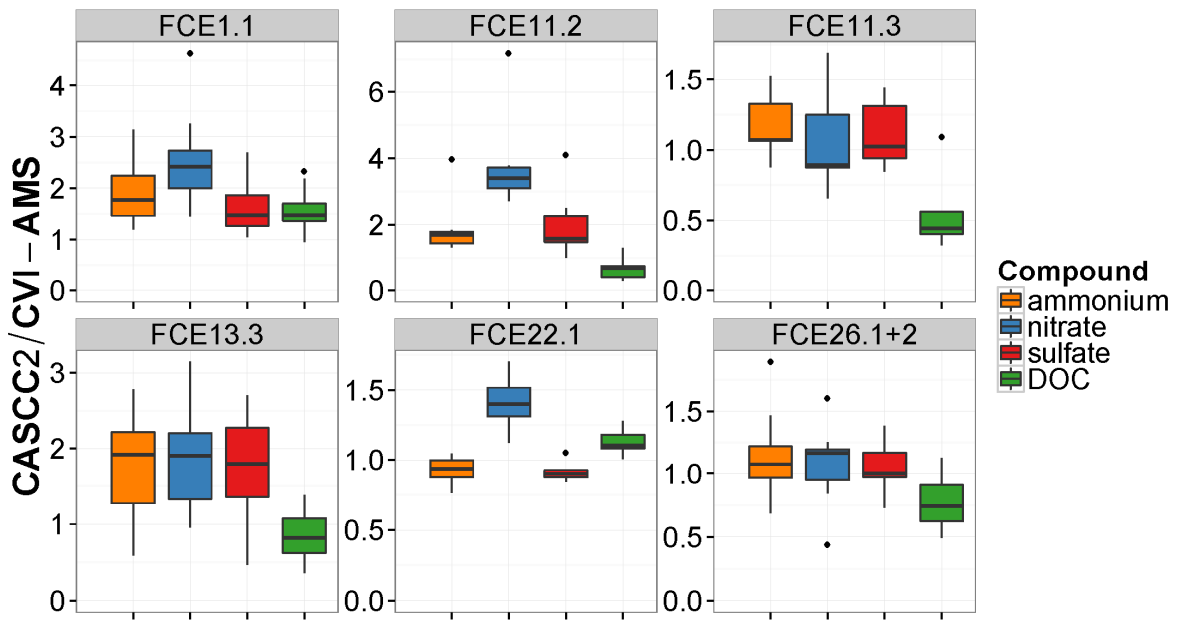


Figure S6: Box-plots of ratios between bulk (CASCC2) and residual particle (CVI-AMS) cloud water loadings for main cloud water constituents. DOC from CVI-AMS calculated as AMS organics divided by 1.8.

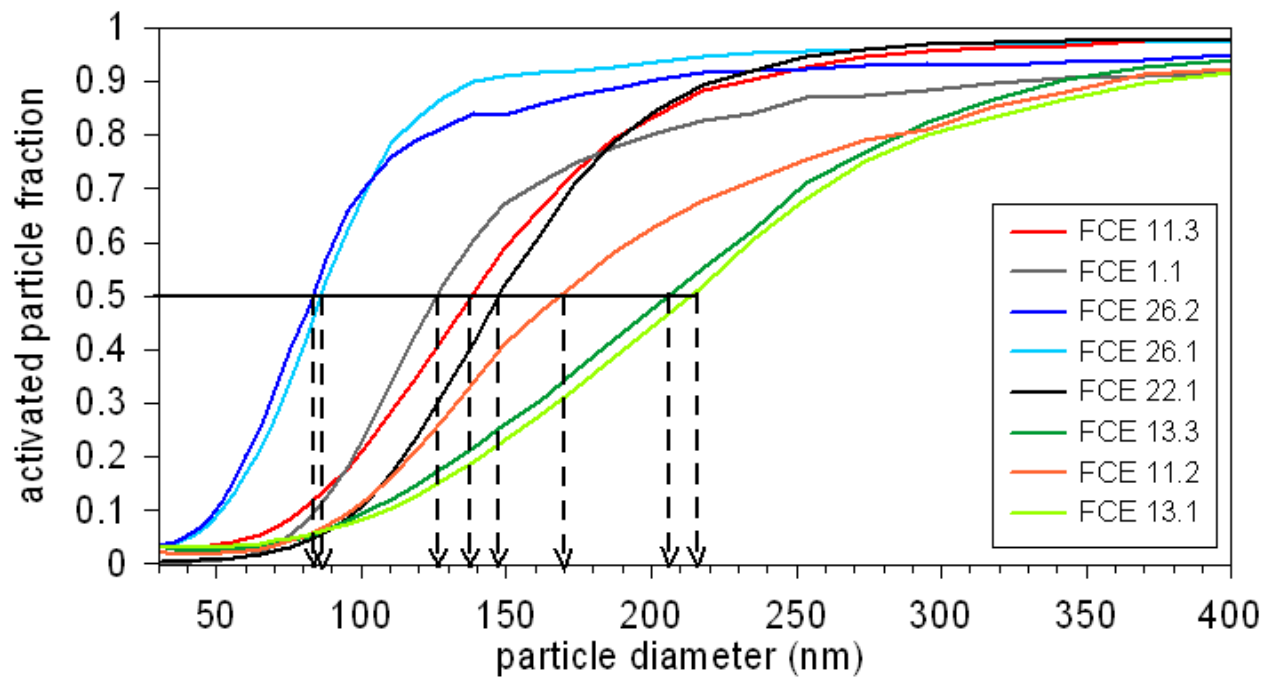


Figure S7: Particle activation curves derived from particle number size distributions of residual particles (CVI inlet) and interstitial particles (INT inlet).

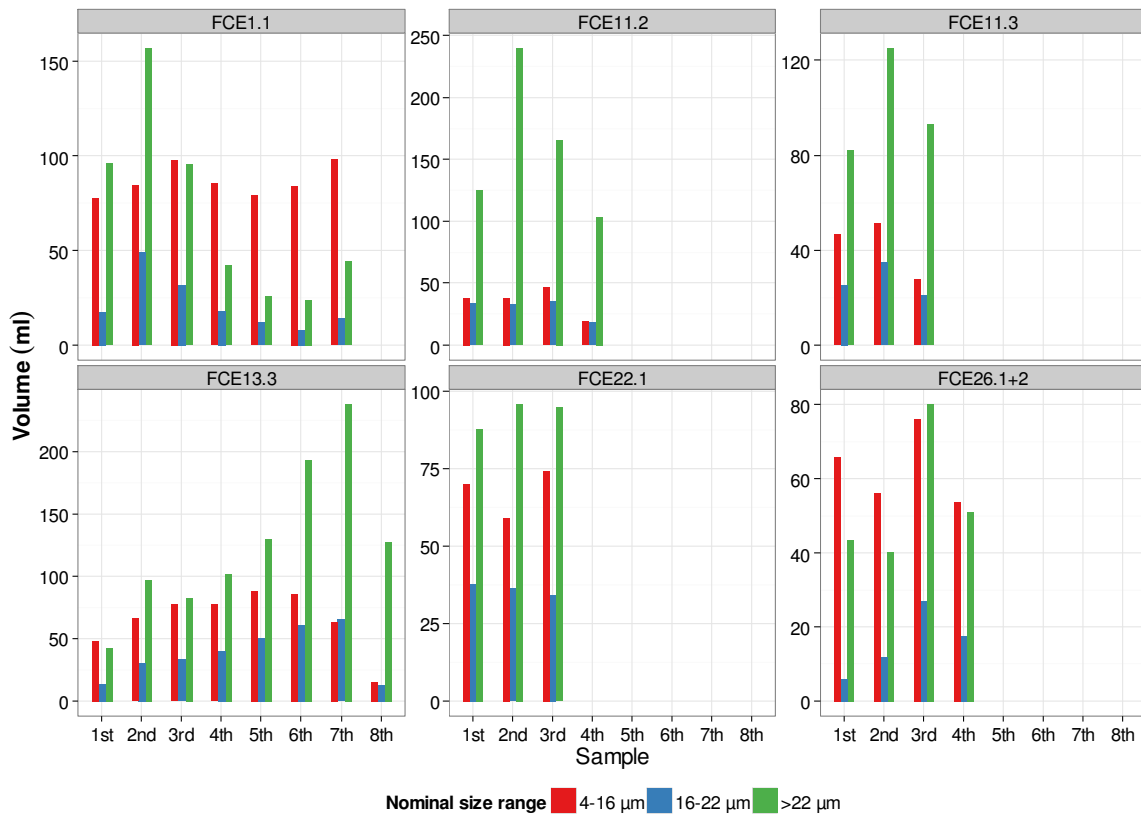


Figure S8: Sampled volumes of cloud water per stage of the 3-stage collector for individual samples.



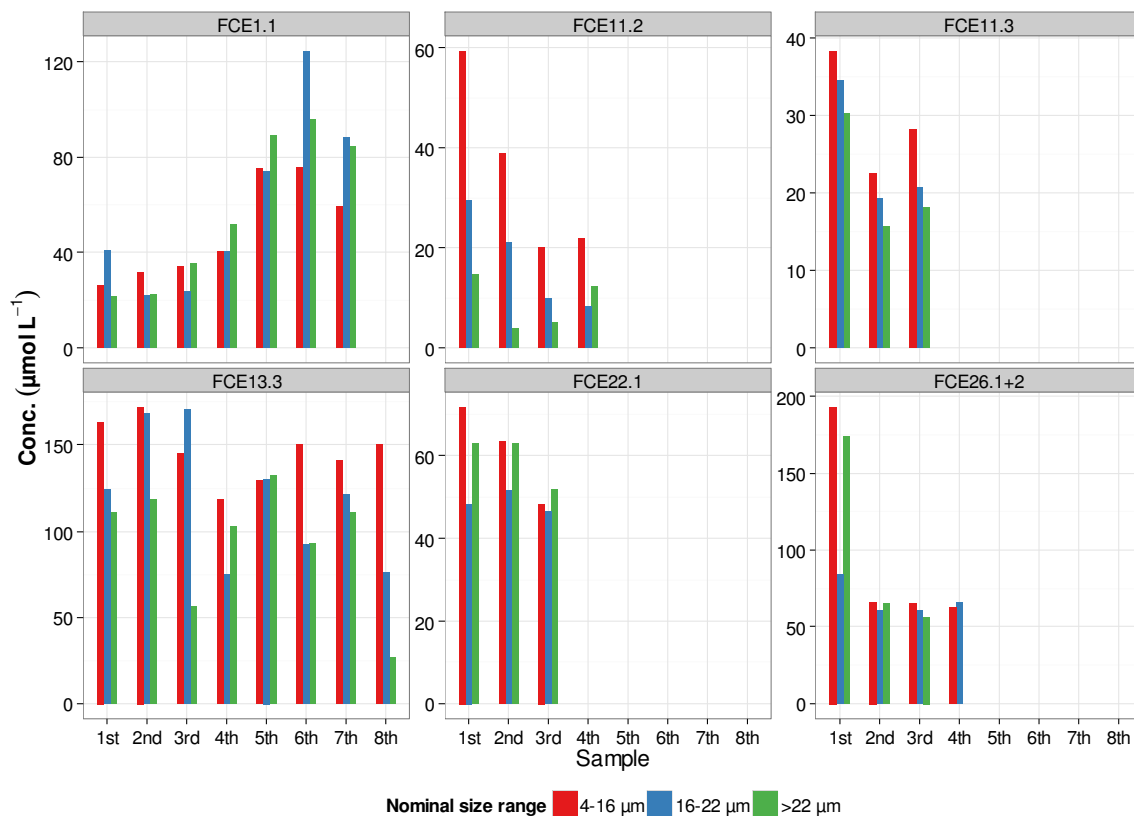


Figure S9: Size-resolved concentrations of sulfate for individual samples from 3-stage cloud water collector.

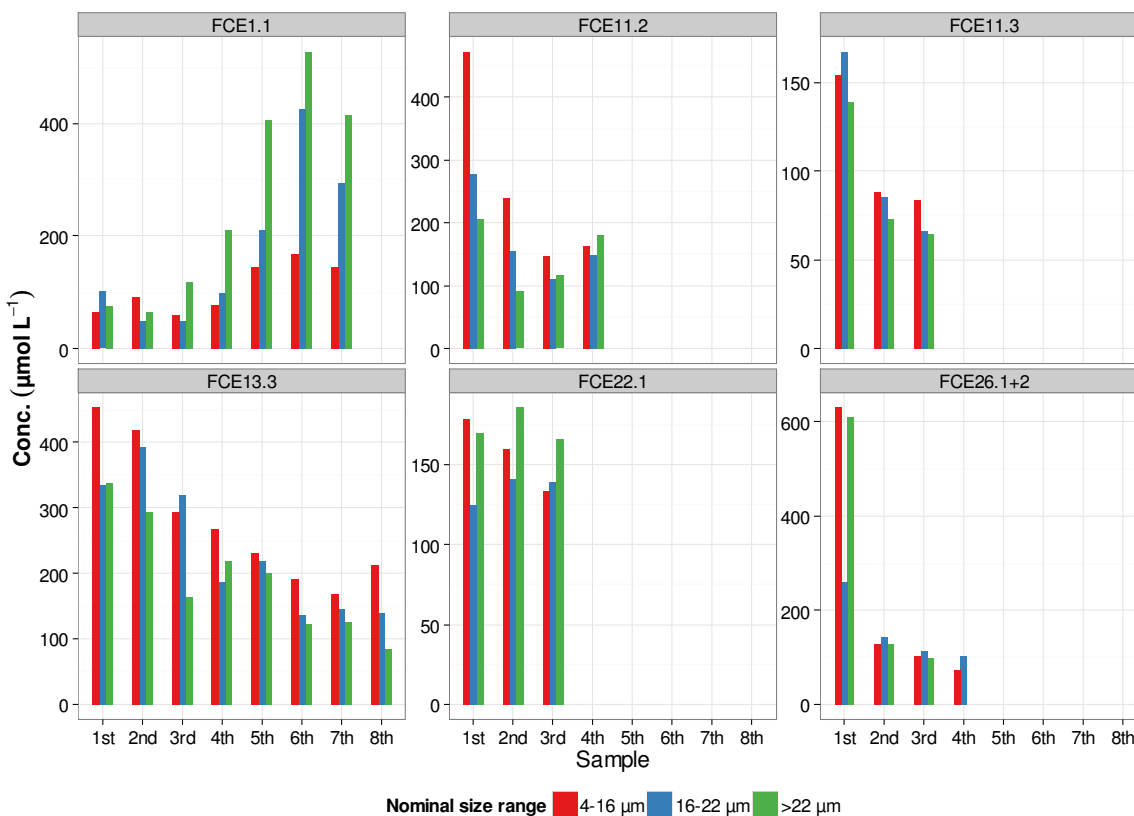
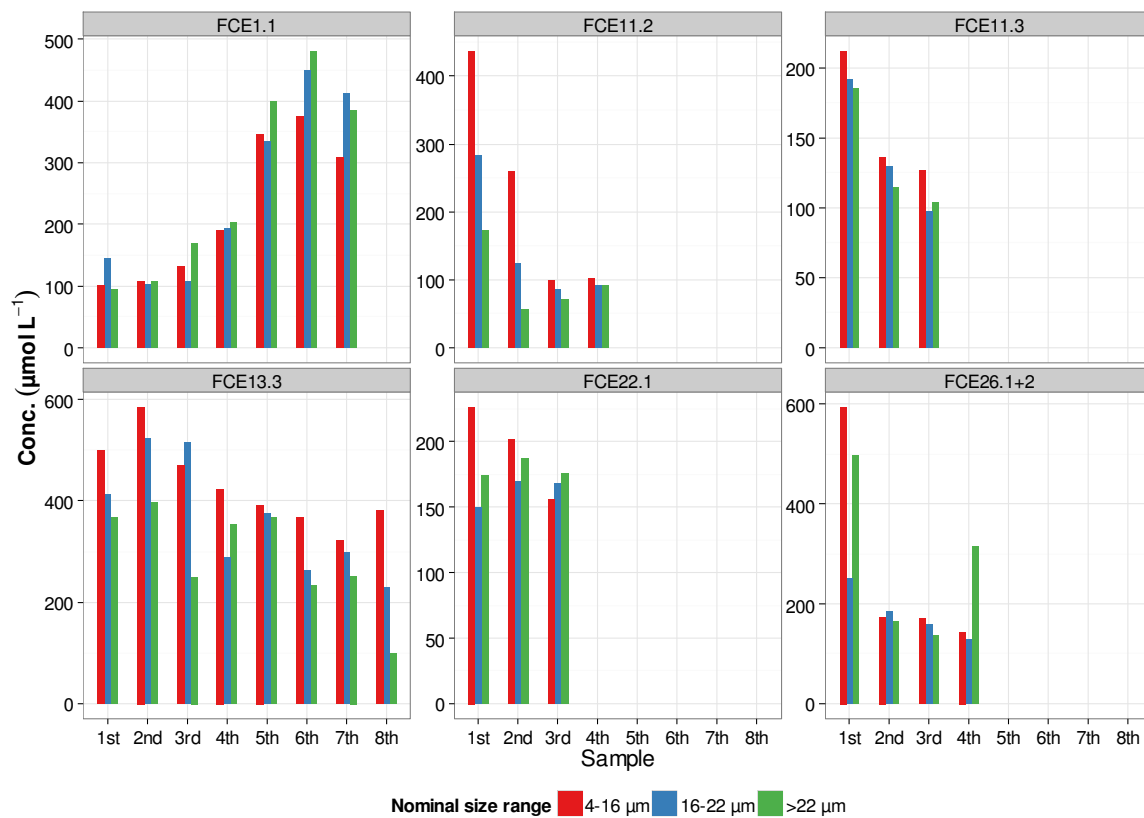
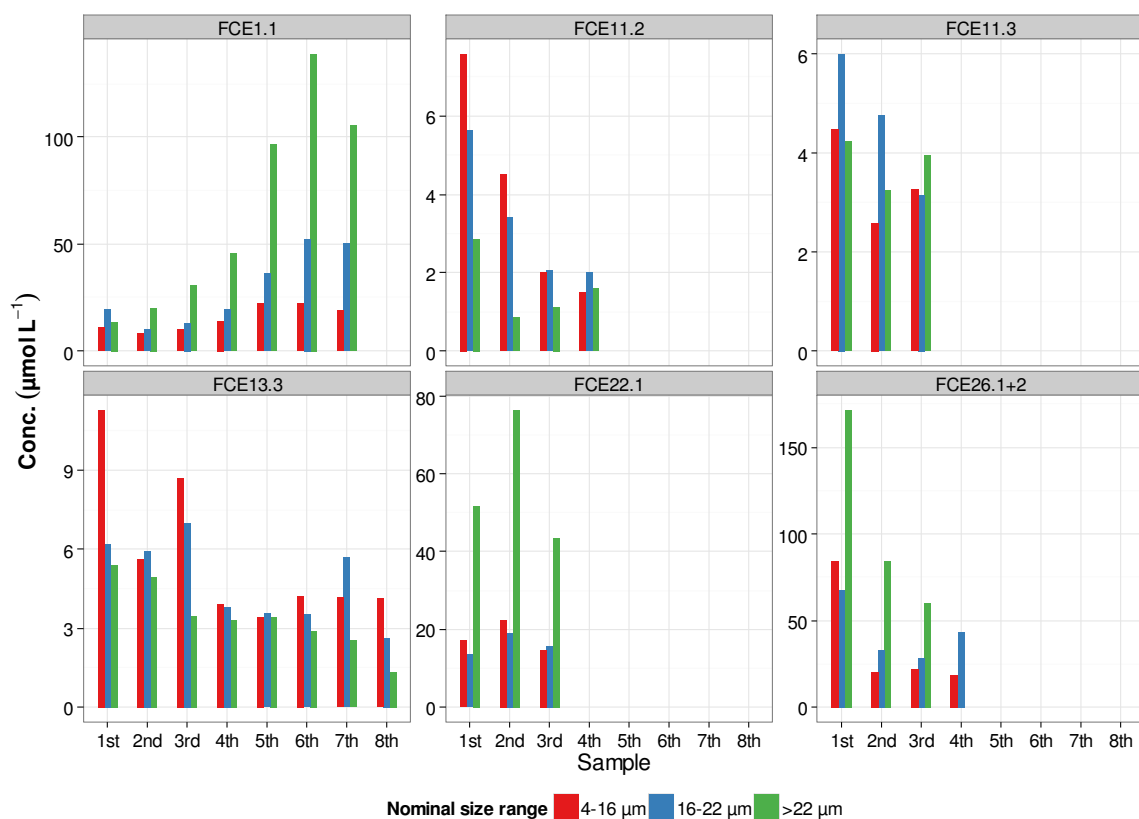


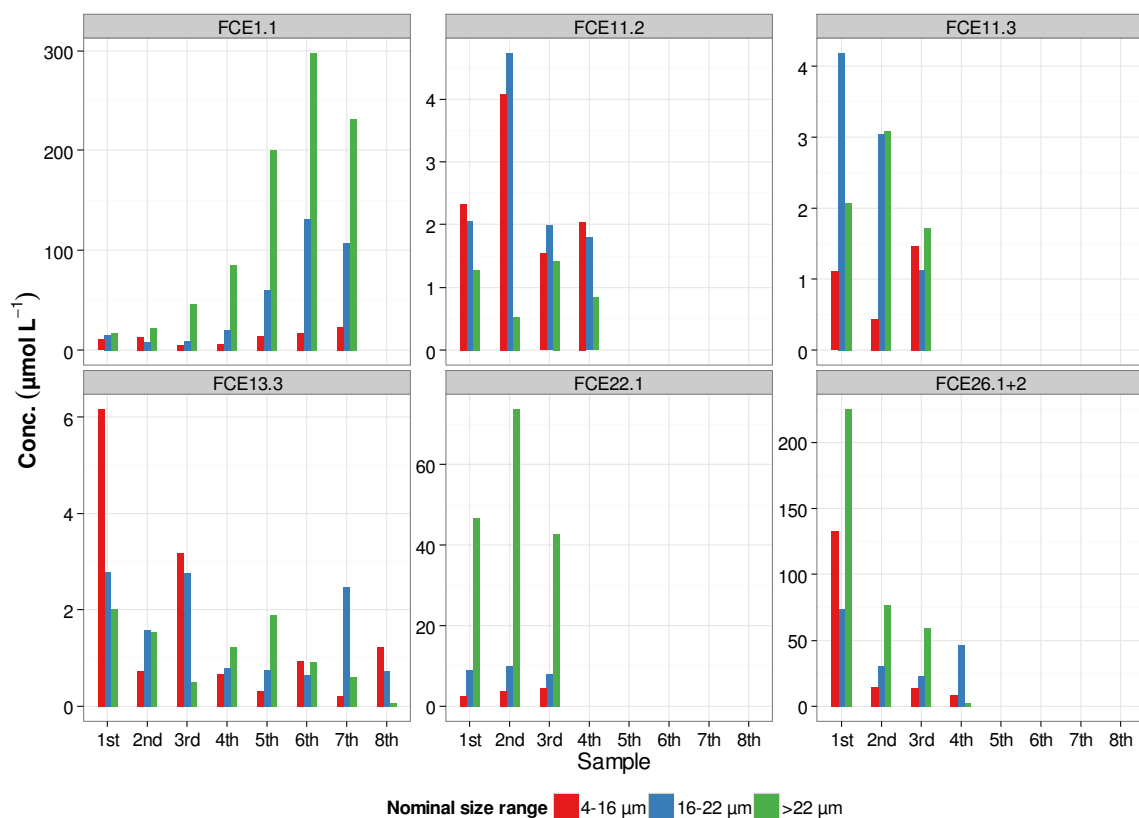
Figure S10: Size-resolved concentrations of nitrate for individual samples from 3-stage cloud water collector.



**Figure S11: Size-resolved concentrations of ammonium for individual samples from 3-stage cloud water collector.**



**Figure S12: Size-resolved concentrations of chloride for individual samples from 3-stage cloud water collector.**



**Figure S13: Size-resolved concentrations of sodium for individual samples from 3-stage cloud water collector.**

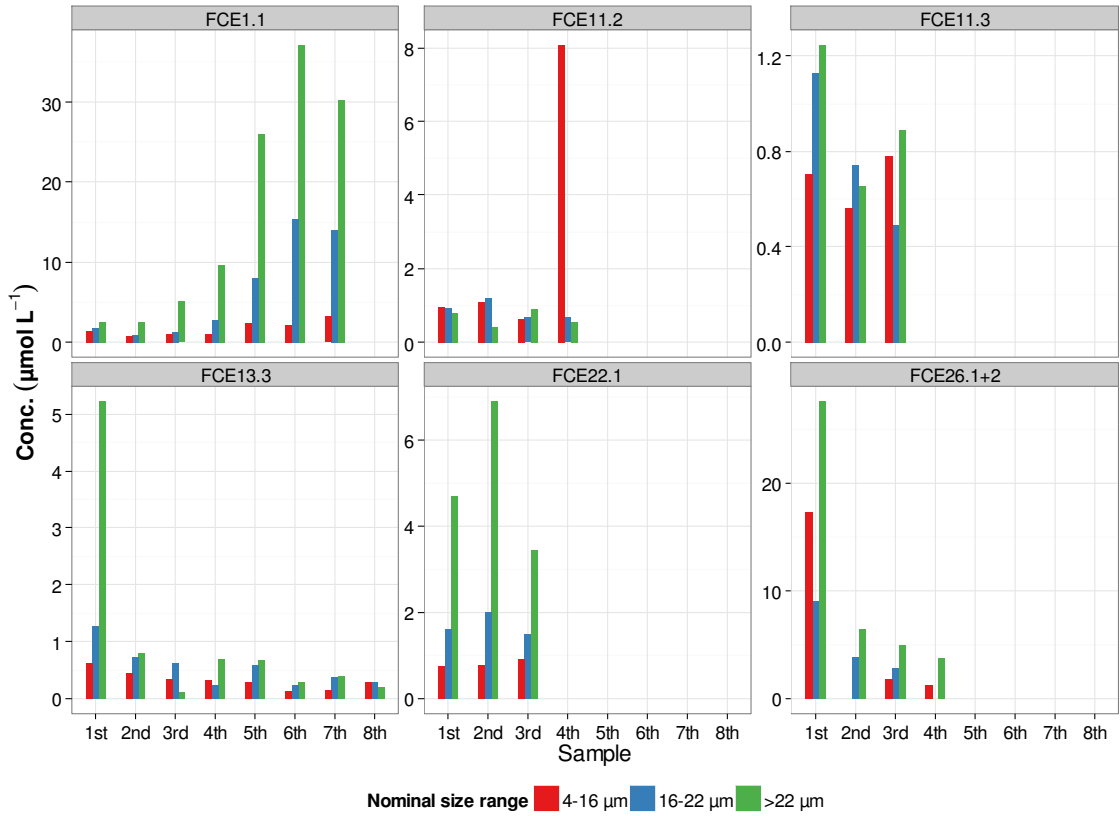


Figure S14: Size-resolved concentrations of magnesium for individual samples from 3-stage cloud water collector.

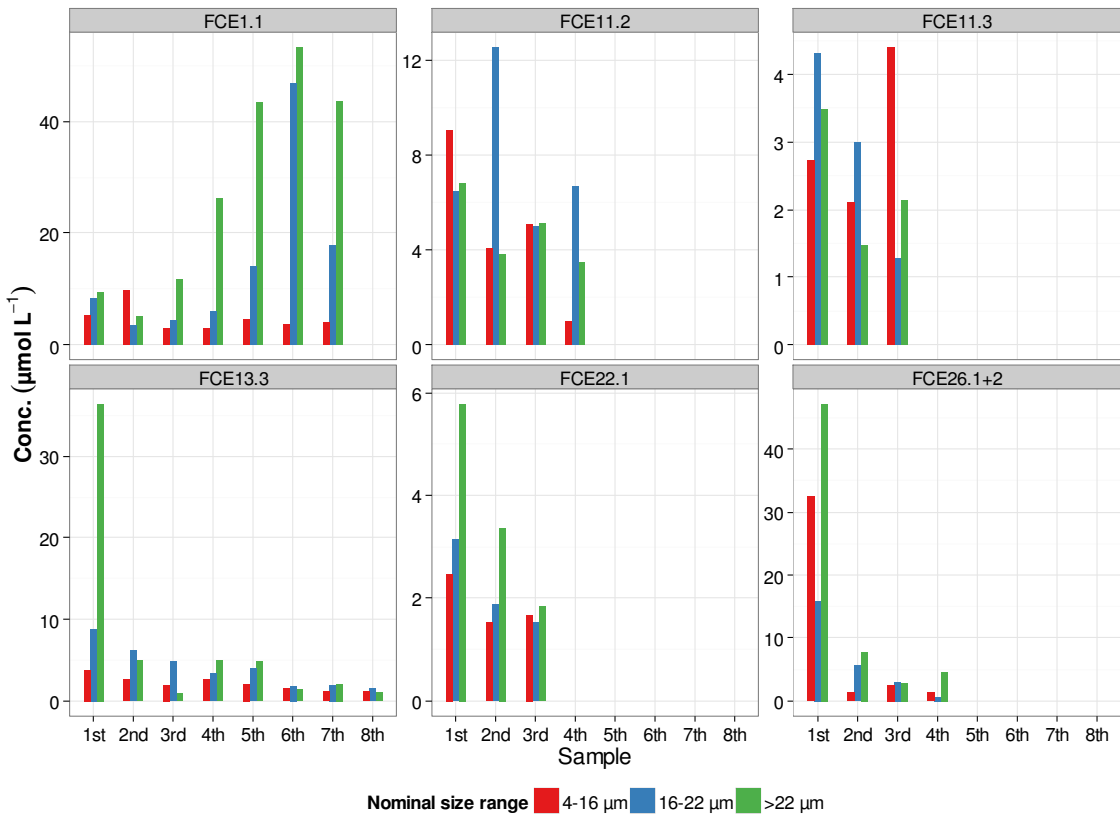


Figure S15: Size-resolved concentrations of calcium for individual samples from 3-stage cloud water collector.

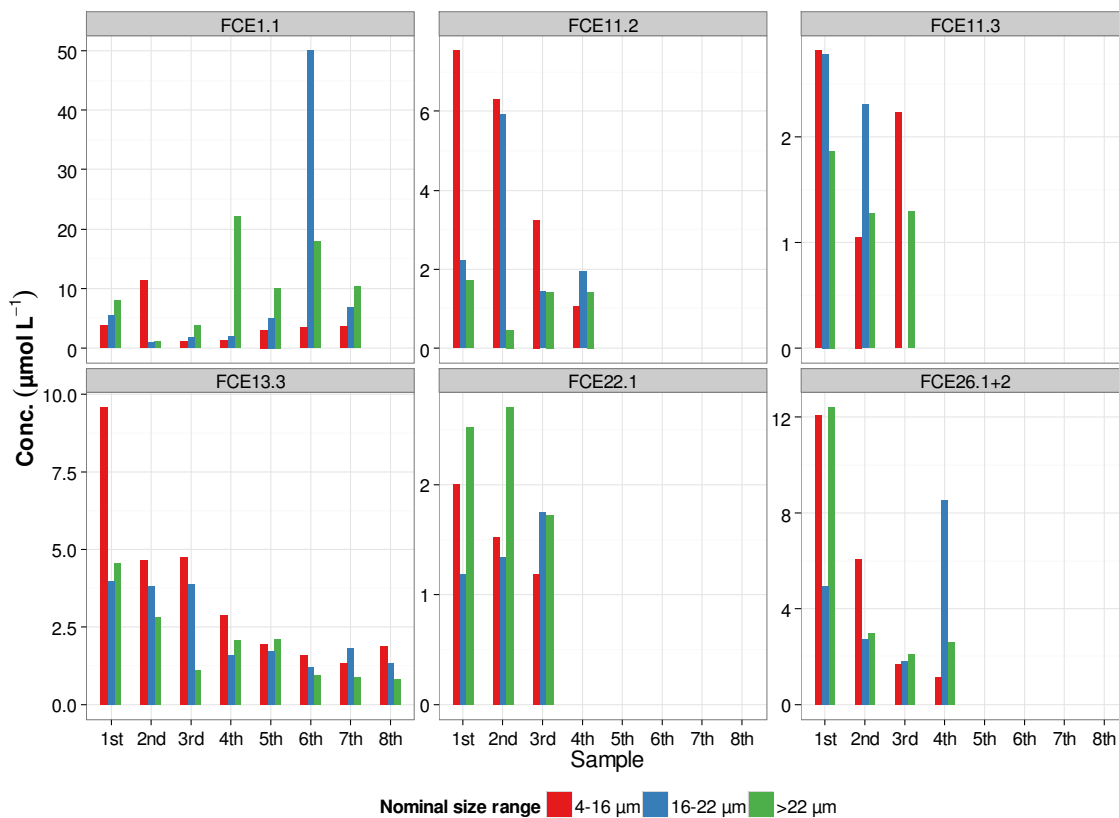


Figure S16: Size-resolved concentrations of potassium for individual samples from 3-stage cloud water collector.

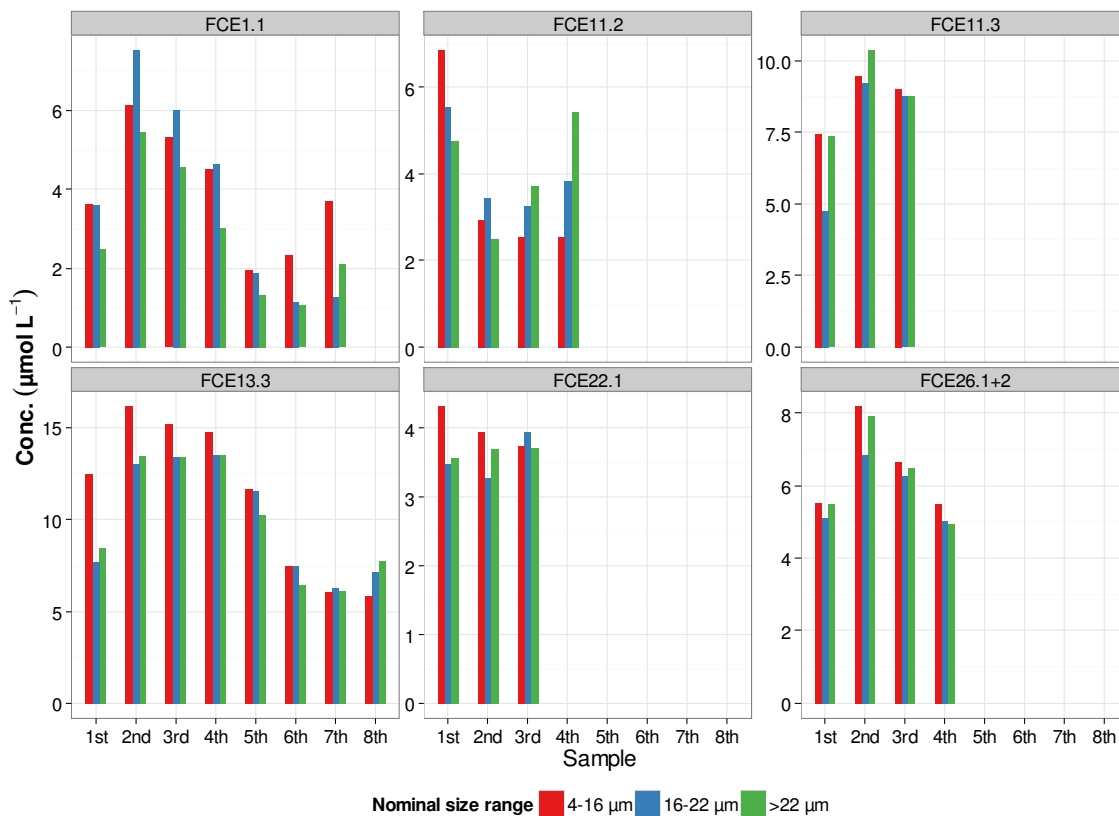


Figure S17: Size-resolved concentrations of  $\text{H}_2\text{O}_2$  (aq) for individual samples from 3-stage cloud water collector.

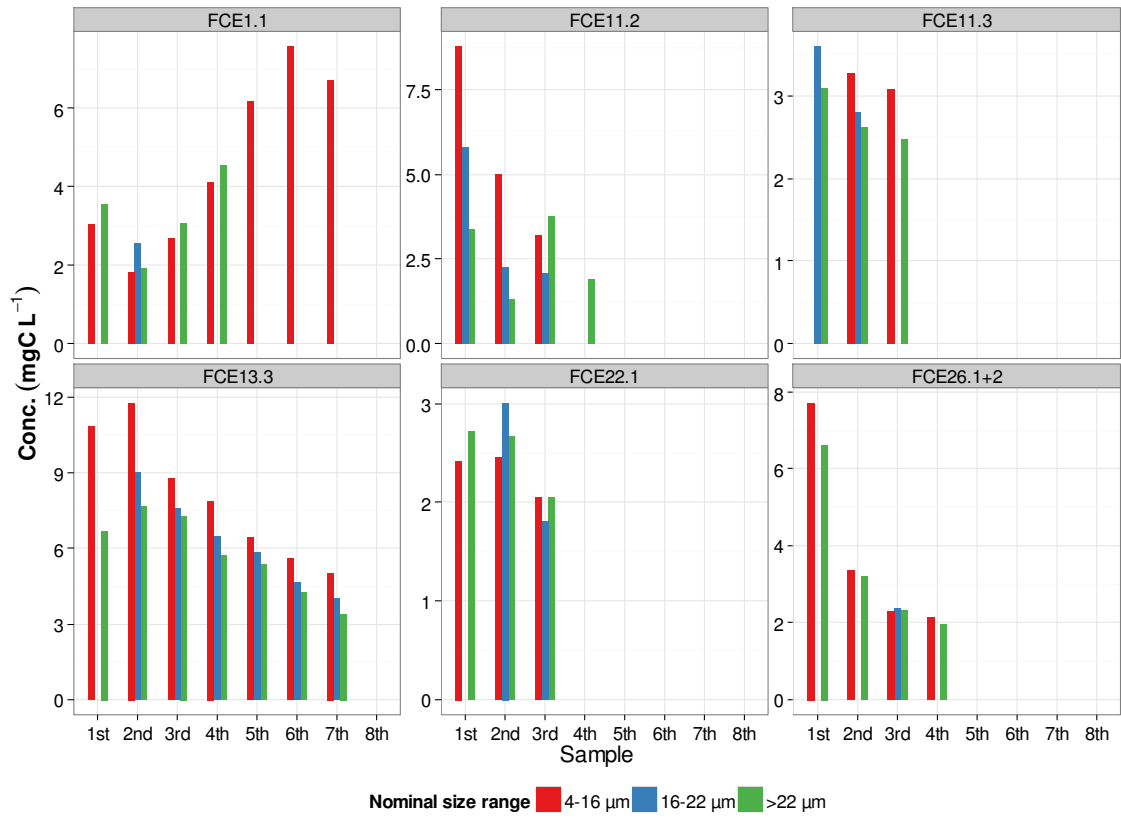


Figure S18: Size-resolved concentrations of DOC for individual samples from 3-stage cloud water collector.

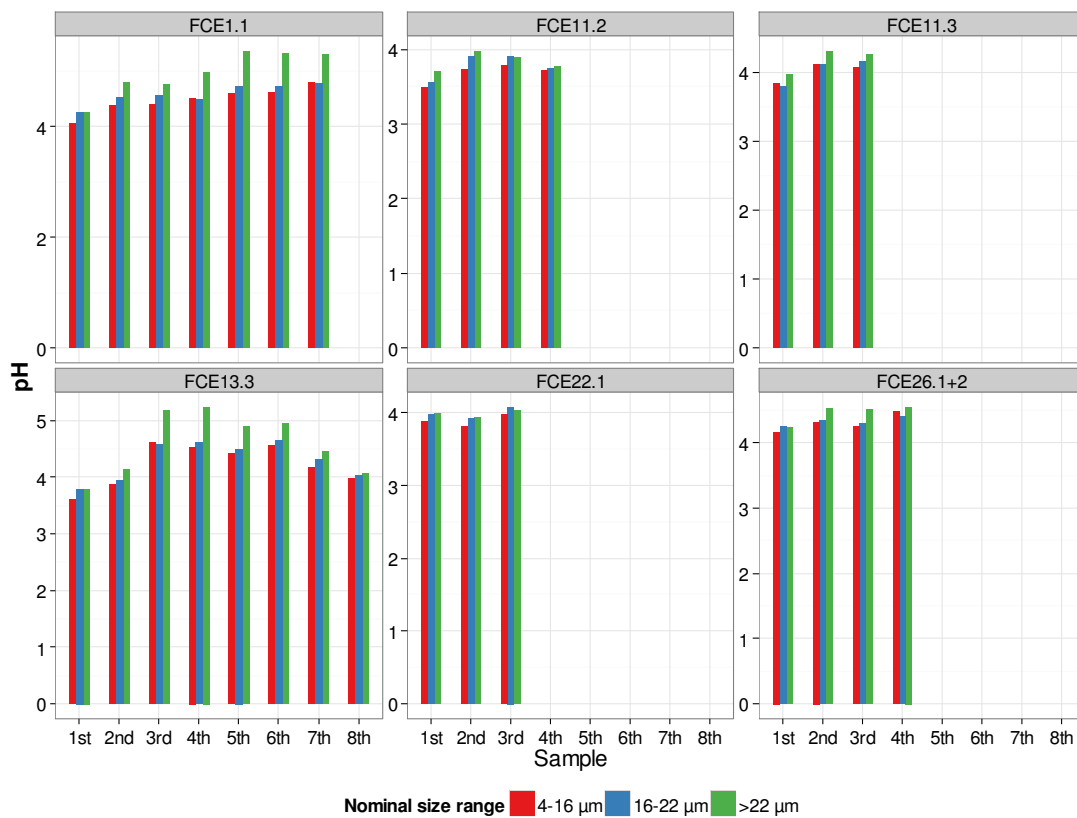


Figure S19: Size-resolved pH values for individual samples from 3-stage cloud water collector.

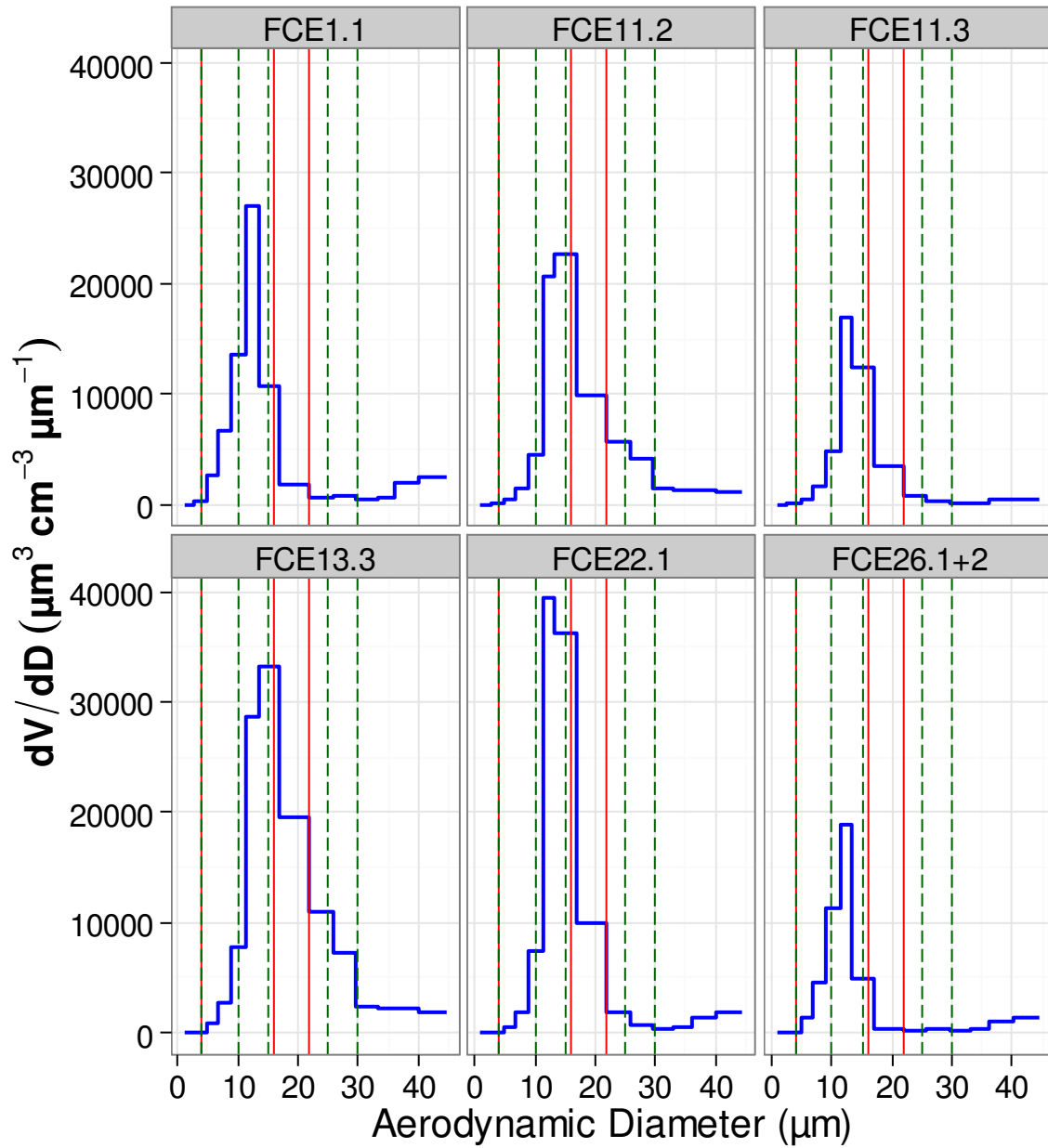


Figure S20: Mean volume size distributions of cloud droplets during main events. Solid red and dashed green lines indicate nominal stage cut-off diameters of 3-stage and 5-stage collector, respectively.



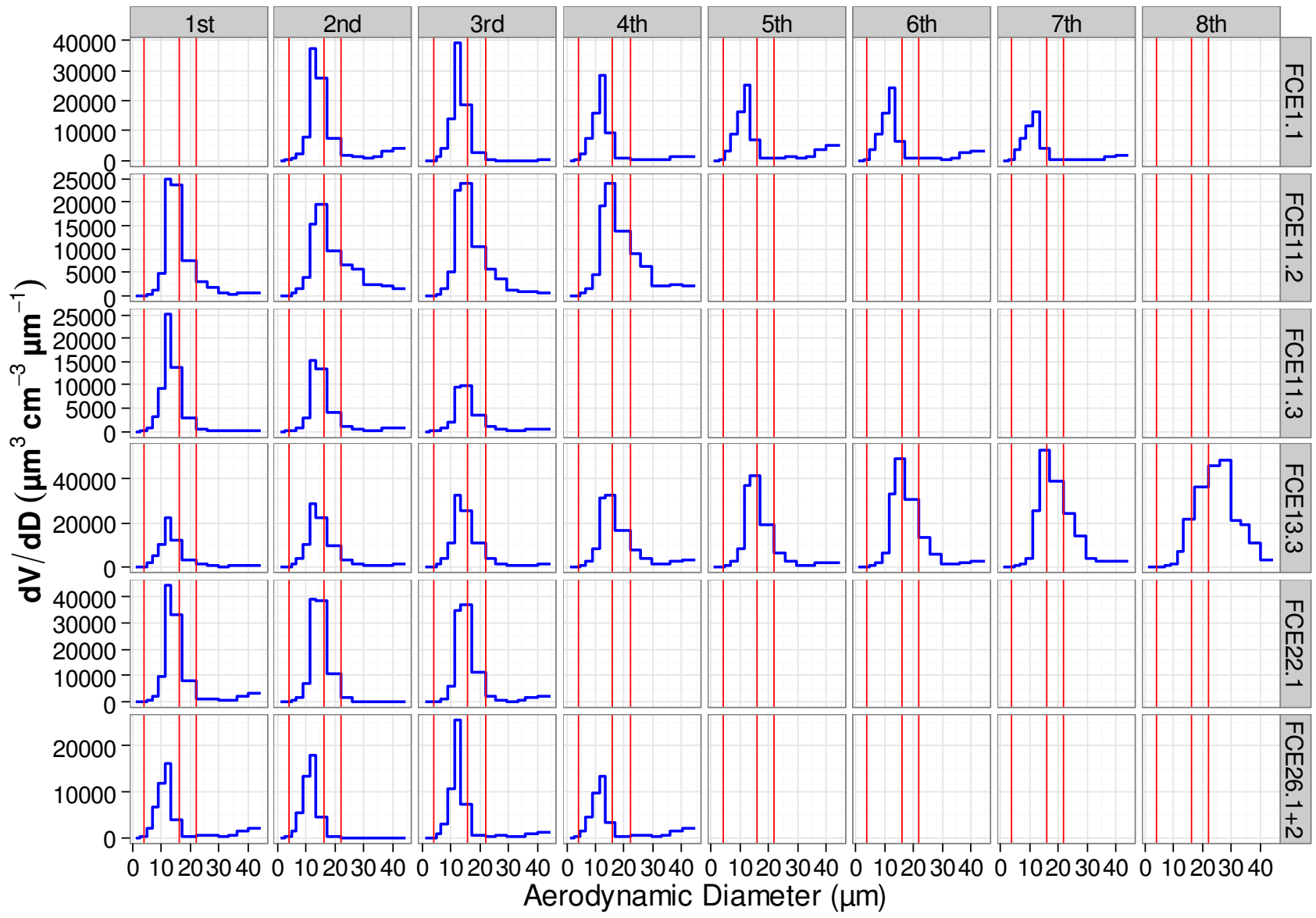


Figure S21: Mean volume size distributions of cloud droplets during individual samples of 3-stage collector. Solid red lines indicate nominal stage cut-off diameters.

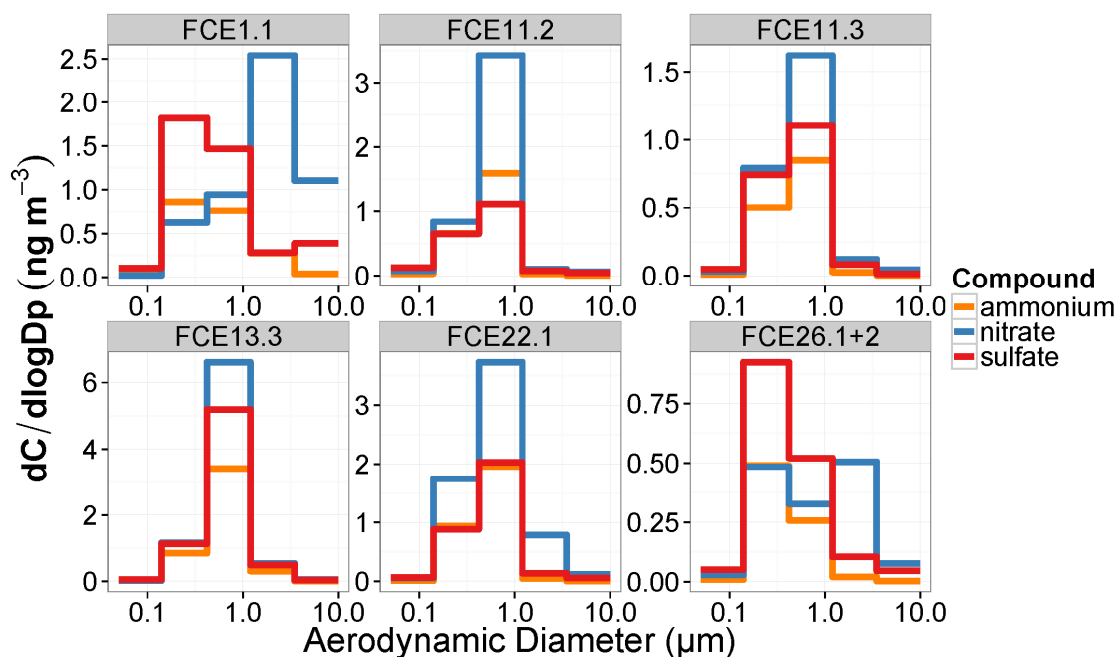


Figure S22: Size distributions of main inorganic ions at upwind site, obtained from 5-stage Berner impactor.

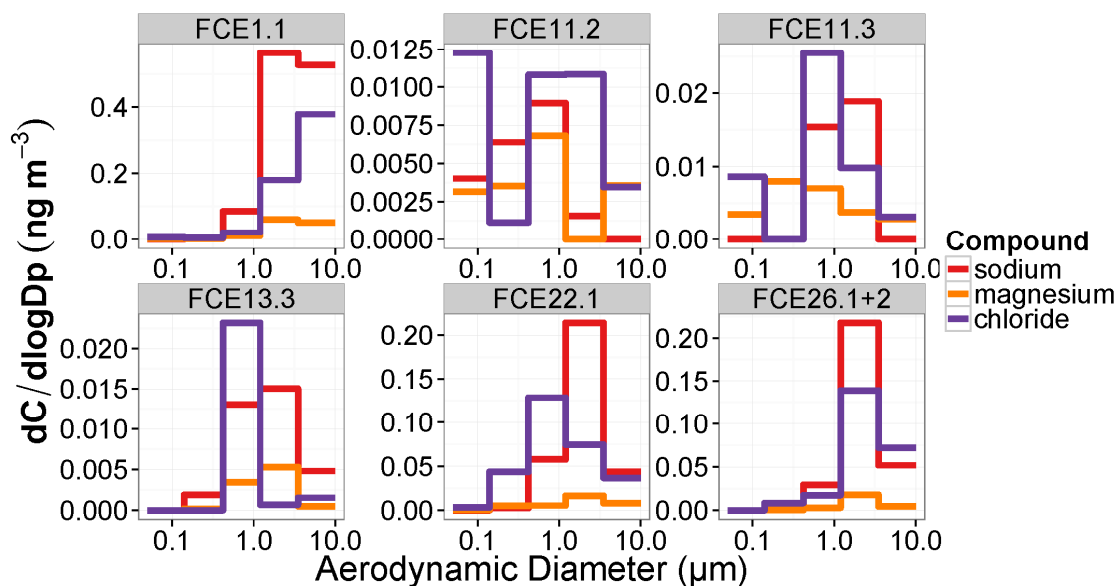


Figure S23: Size distributions of minor inorganic ions at upwind site, obtained from 5-stage Berner impactor.

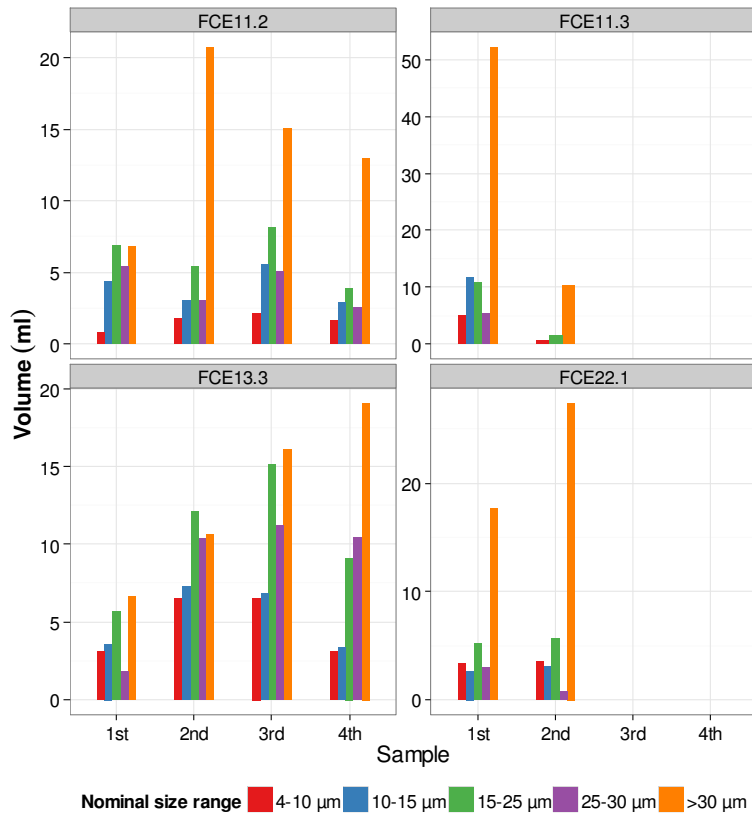


Figure S24: Sampled volumes of cloud water per stage of the 5-stage collector for individual samples.

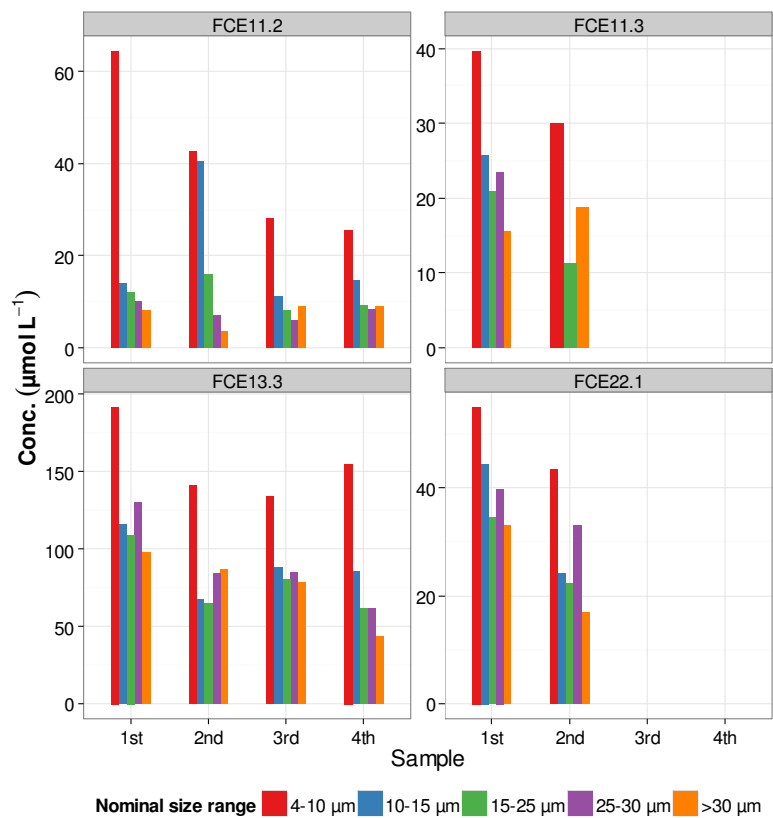


Figure S25: Size-resolved concentrations of sulfate for individual samples from 5-stage cloud water collector.

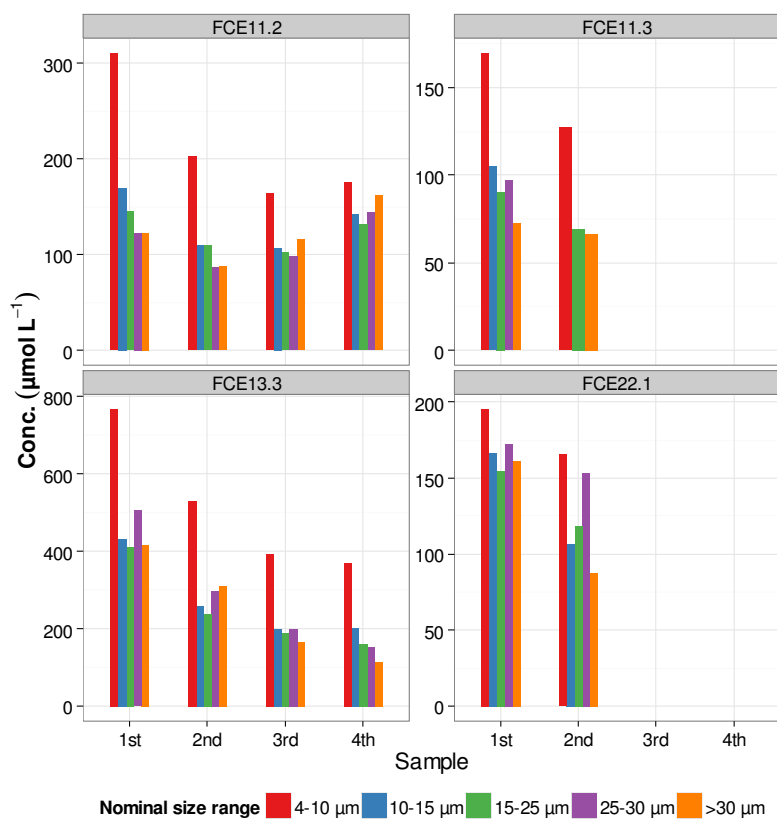


Figure S26: Size-resolved concentrations of nitrate for individual samples from 5-stage cloud water collector.

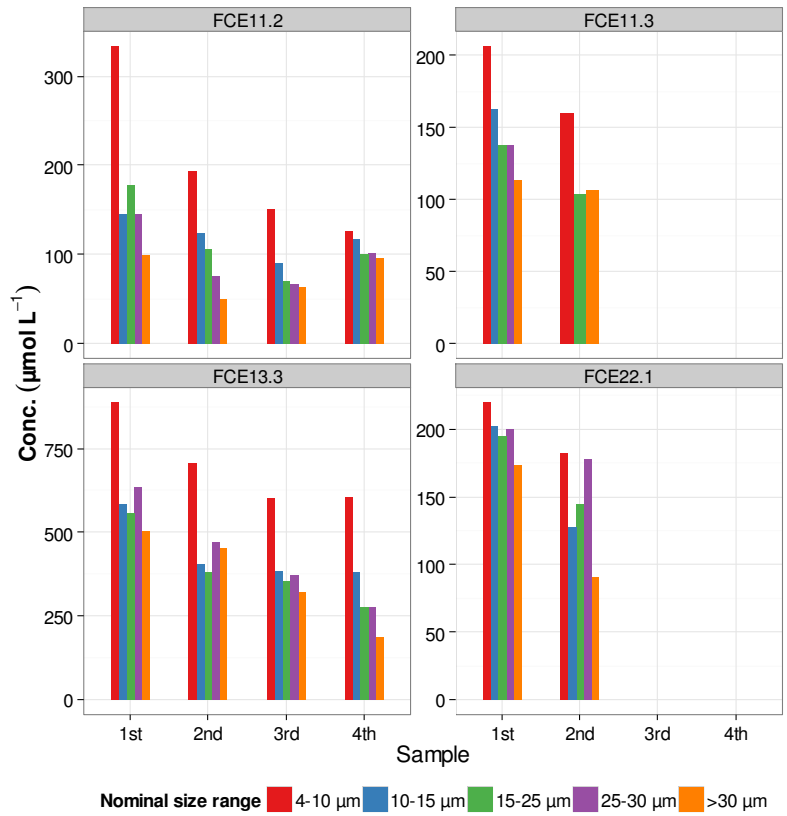


Figure S27: Size-resolved concentrations of ammonium for individual samples from 5-stage cloud water collector.

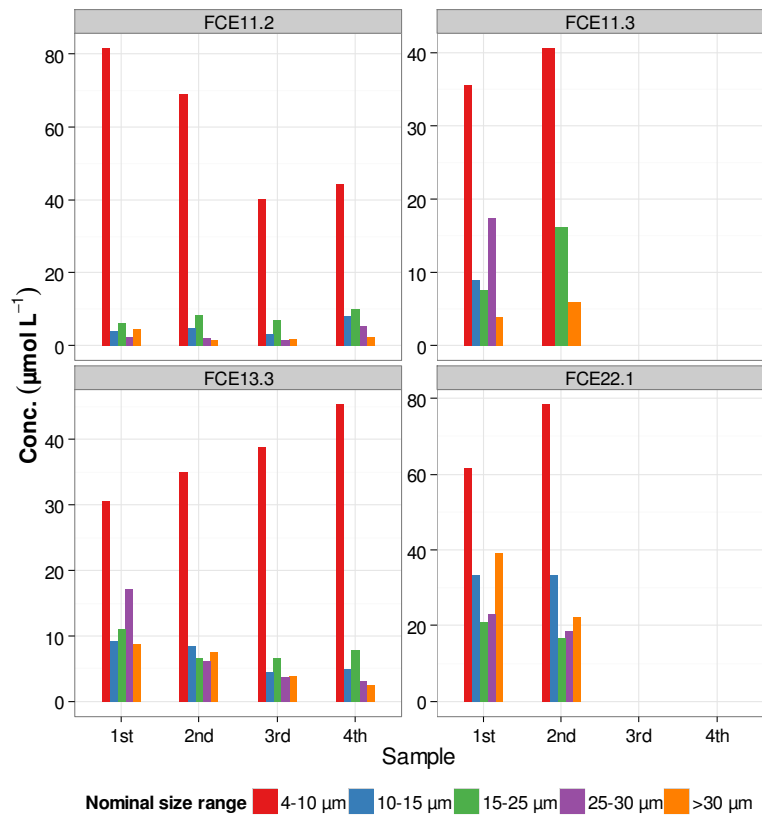


Figure S28: Size-resolved concentrations of chloride for individual samples from 5-stage cloud water collector.

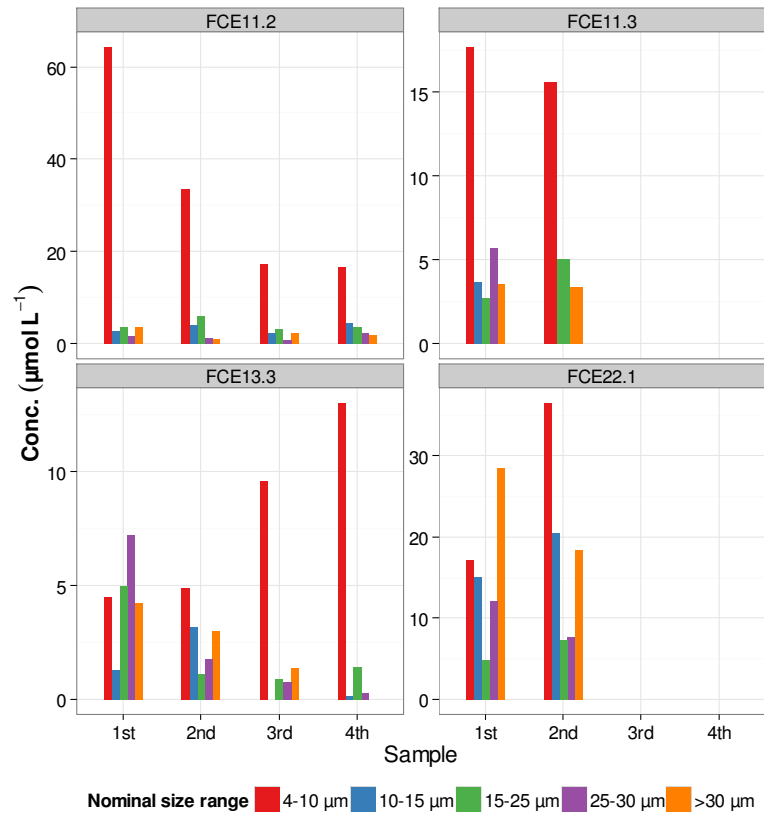


Figure S29: Size-resolved concentrations of sodium for individual samples from 5-stage cloud water collector.

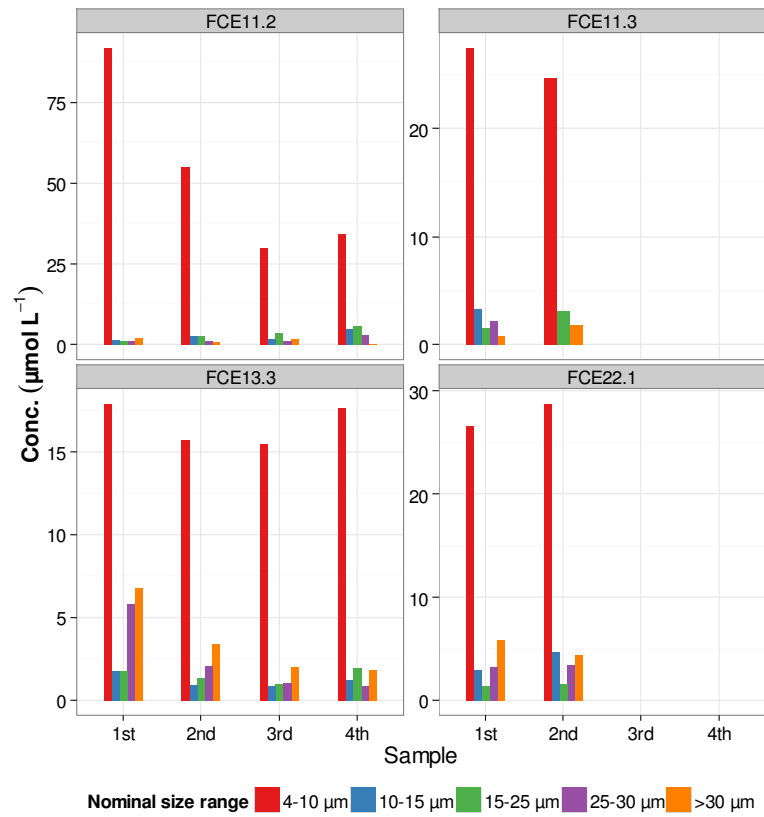


Figure S30: Size-resolved concentrations of magnesium for individual samples from 5-stage cloud water collector.

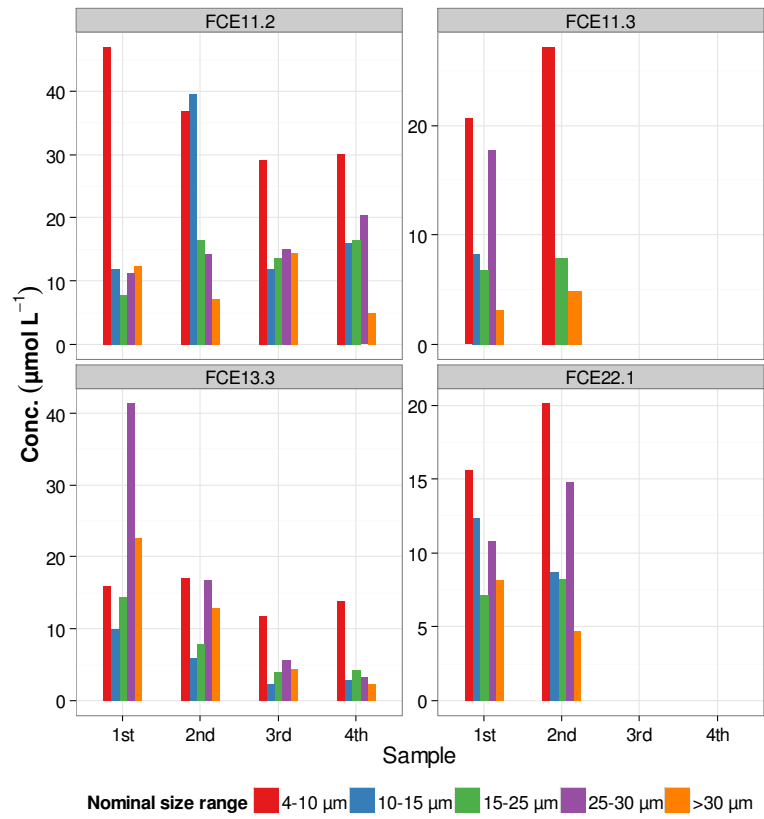


Figure S31: Size-resolved concentrations of calcium for individual samples from 5-stage cloud water collector.

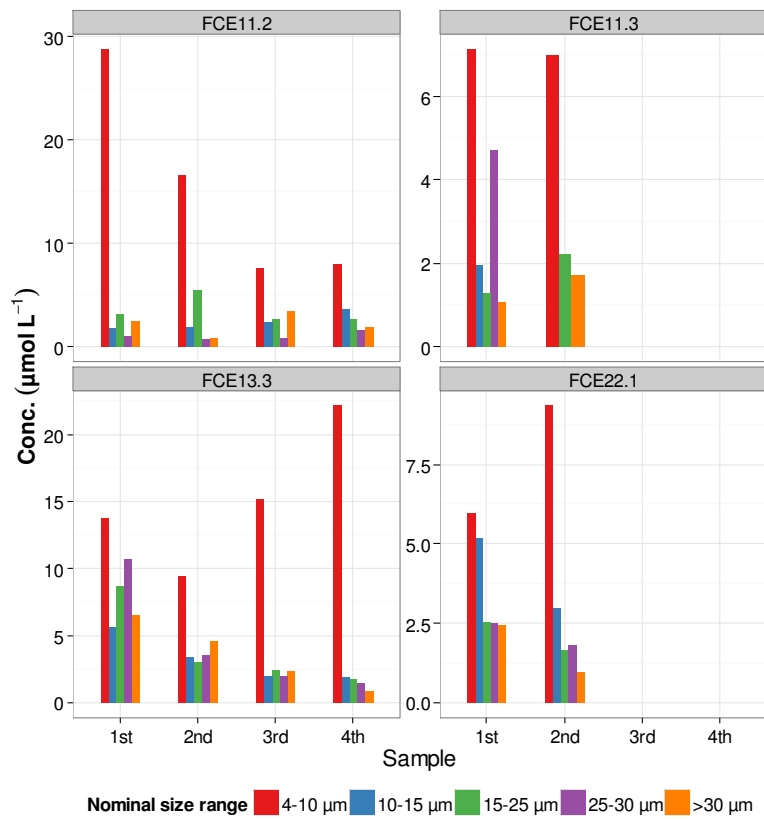


Figure S32: Size-resolved concentrations of potassium for individual samples from 5-stage cloud water collector.

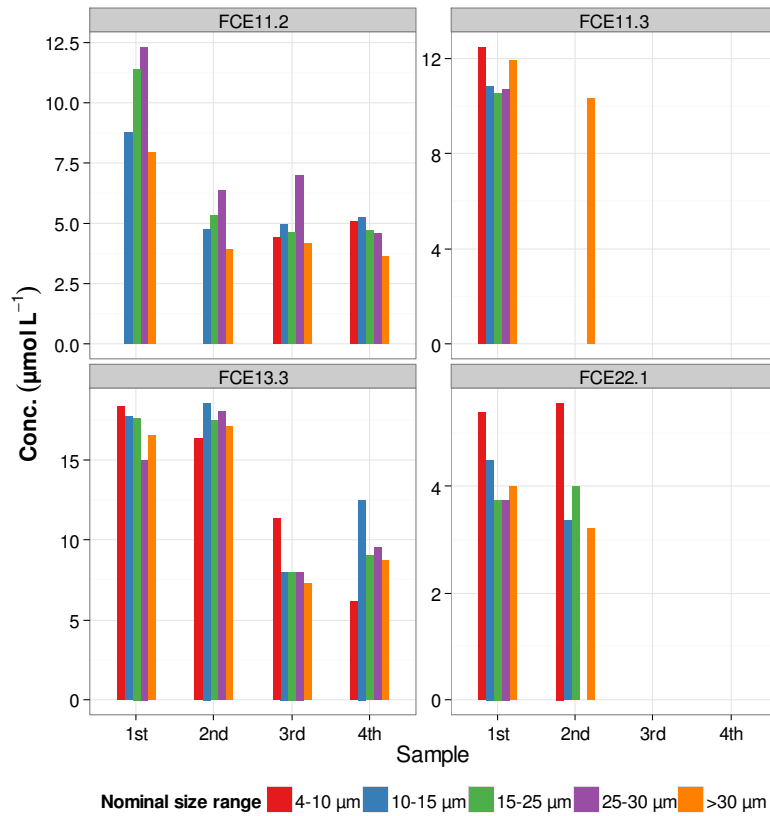


Figure S33: Size-resolved concentrations of  $\text{H}_2\text{O}_2$  (aq) for individual samples from 5-stage cloud water collector.

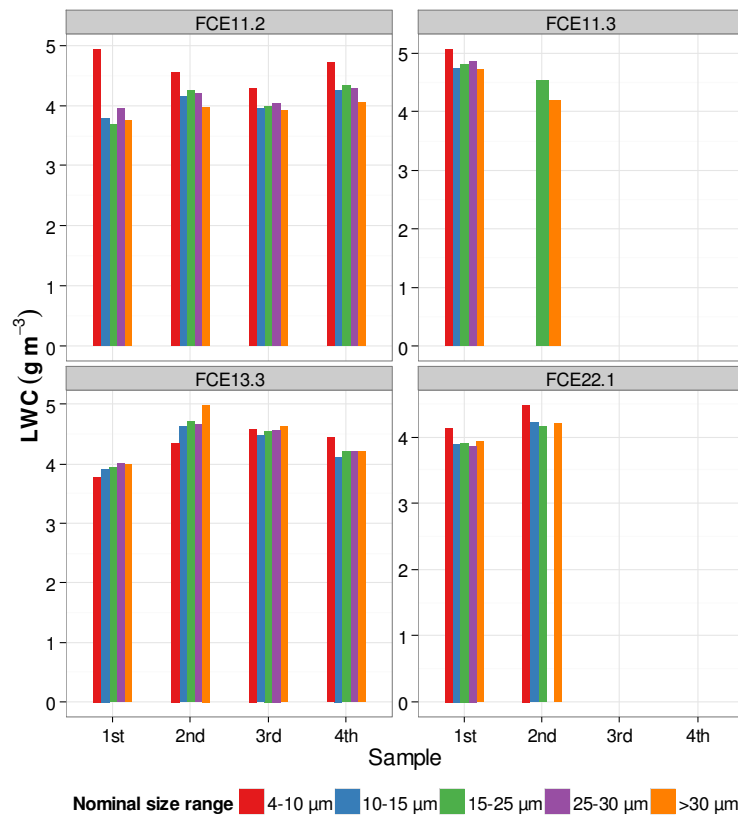


Figure S34: Size-resolved pH values for individual samples from 5-stage cloud water collector.



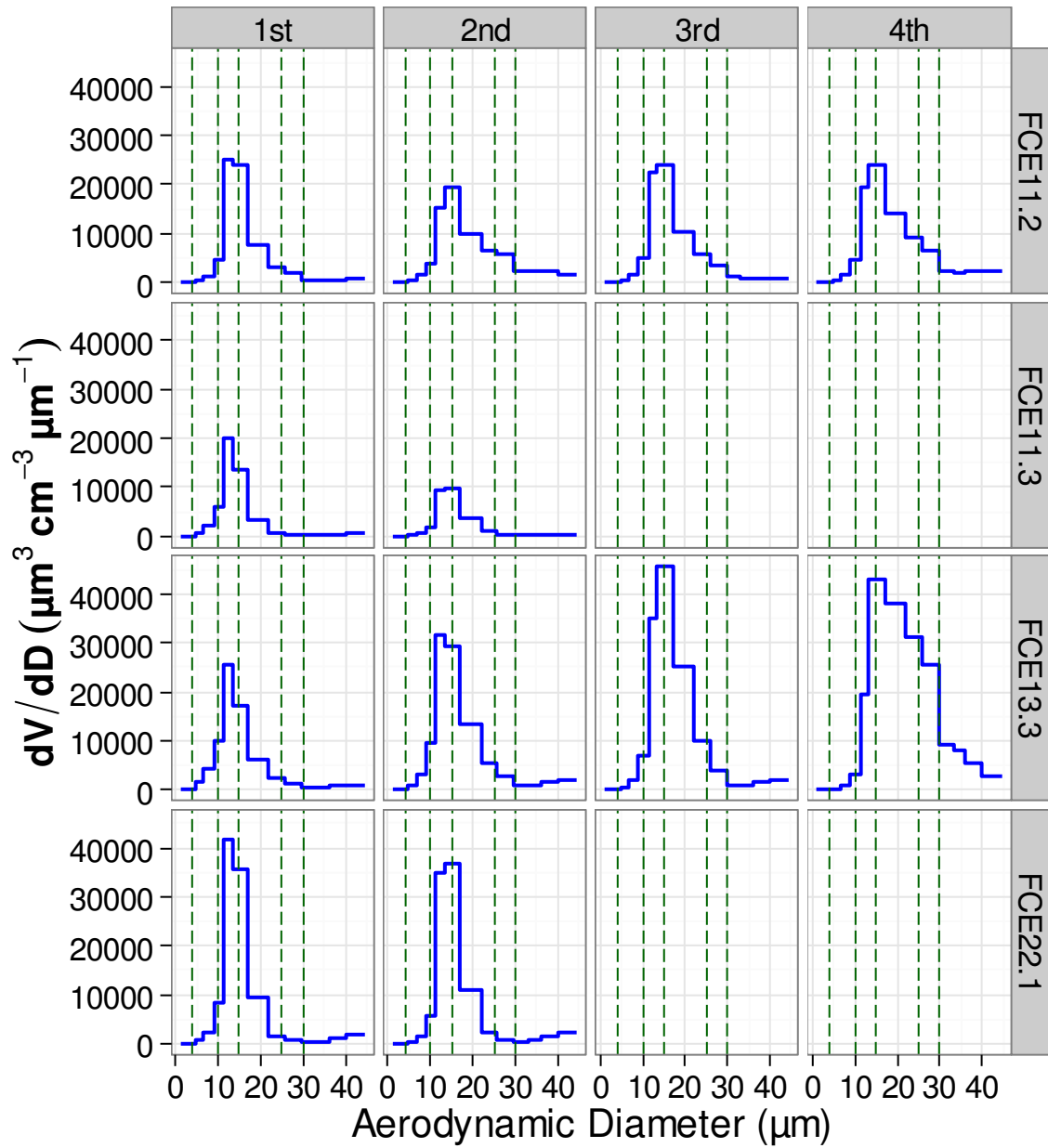


Figure S35: Mean volume size distributions of cloud droplets during individual samples of 5-stage collector. Dashed green lines indicate nominal stage cut-off diameters.