Supplementary Materials

Settling of Road-Deposited Sediment: Influence of Particle Density, Shape, Low Temperatures, and De-Icing Salt

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Materials and Methods

To assess the comparability of filtration and evaporation to determine the settled mass fraction, 100 mg of MiW4 were added to 10 mL DI water and analyzed.

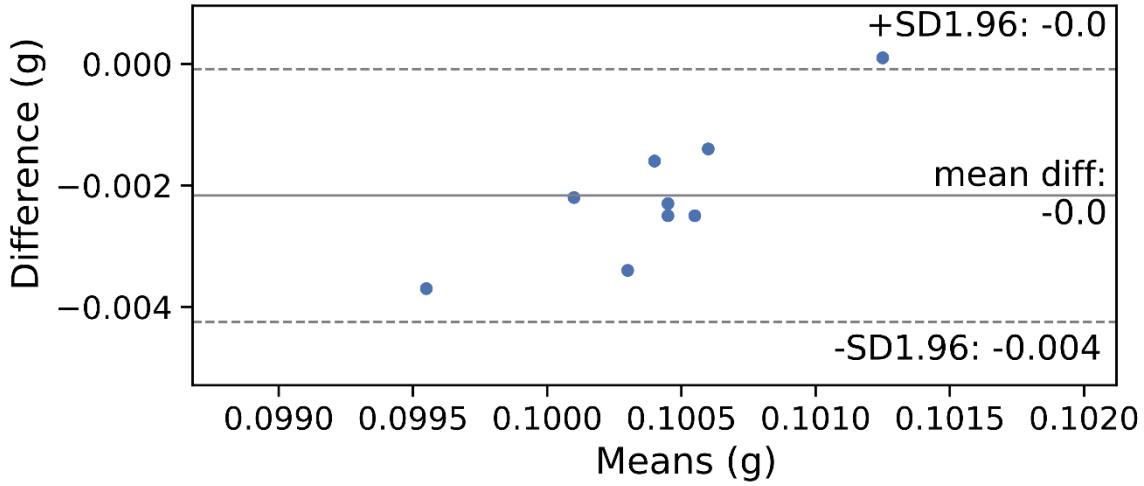

Figure S1. Bland–Altman plot for comparison of the two methods for the determination of the settled fraction (evaporation and filtration), the area between the dashed lines indicates the 95% confidence interval, n=9, one outlier was removed.

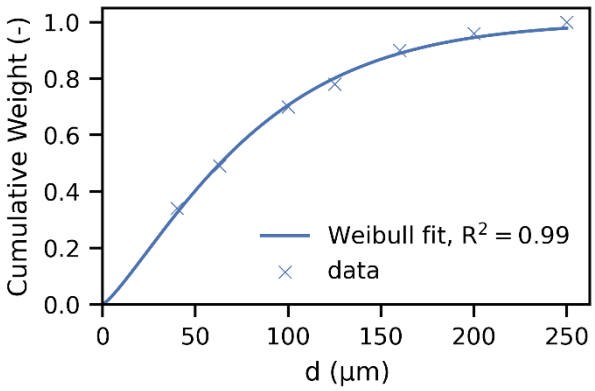

Figure S2. Particle size distribution of the pre-processed road-deposited sediments, fitted Weibull distribution for subsequent modeling of the sedimentation processes.

Results

Particle size and shape

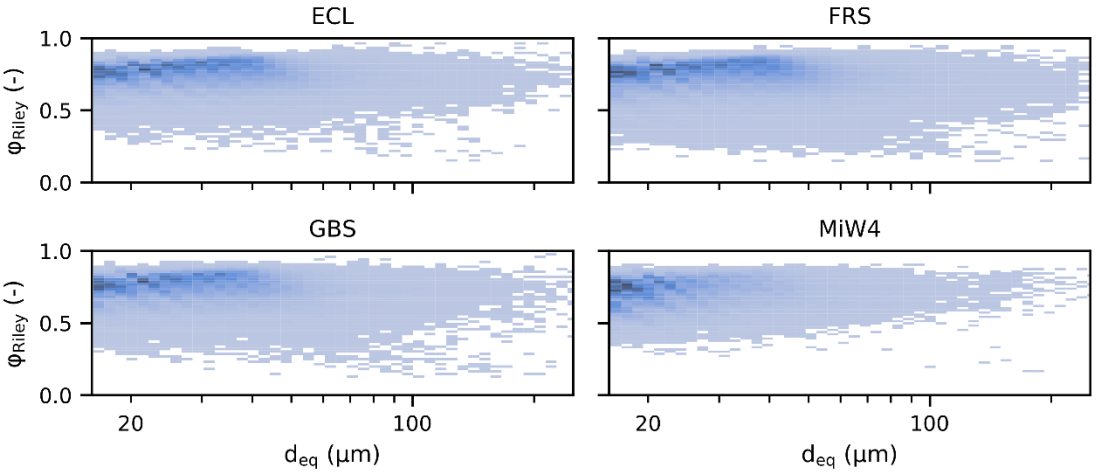

Figure S3. 2D histogram of φ_{Riley} with respect to d_{eq} of all analyzed samples, color opacity indicates the density of counts, ECL n=130,986, FRS n=211,209, GBS n=134,392, MiW4 n=57,973.

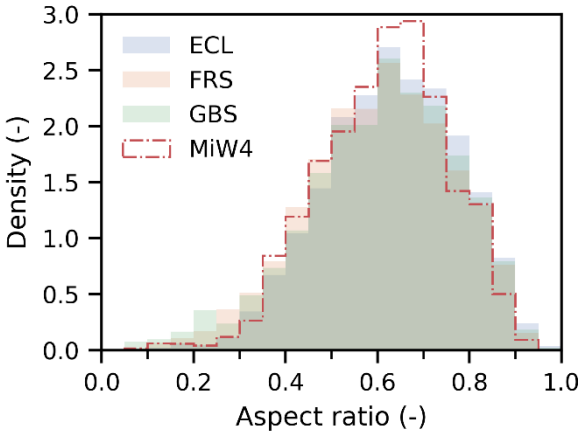

Figure S4. Mass fraction weighted histogram of the aspect ratios of the analyzed samples, ECL n=130,986, FRS n=211,209, GBS n=134,392, MiW4 n=57,973.

Settling experiments

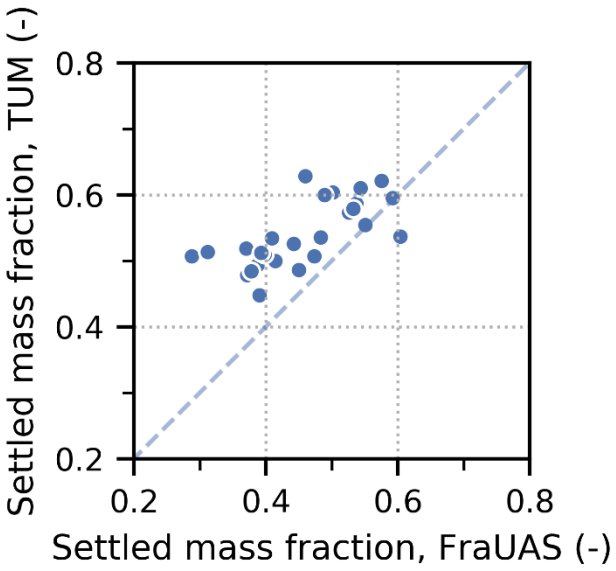

Figure S5. Comparison of the experimental results of settling experiments using the method described in this paper conducted by two different executers, n=27.

Validation of settling model

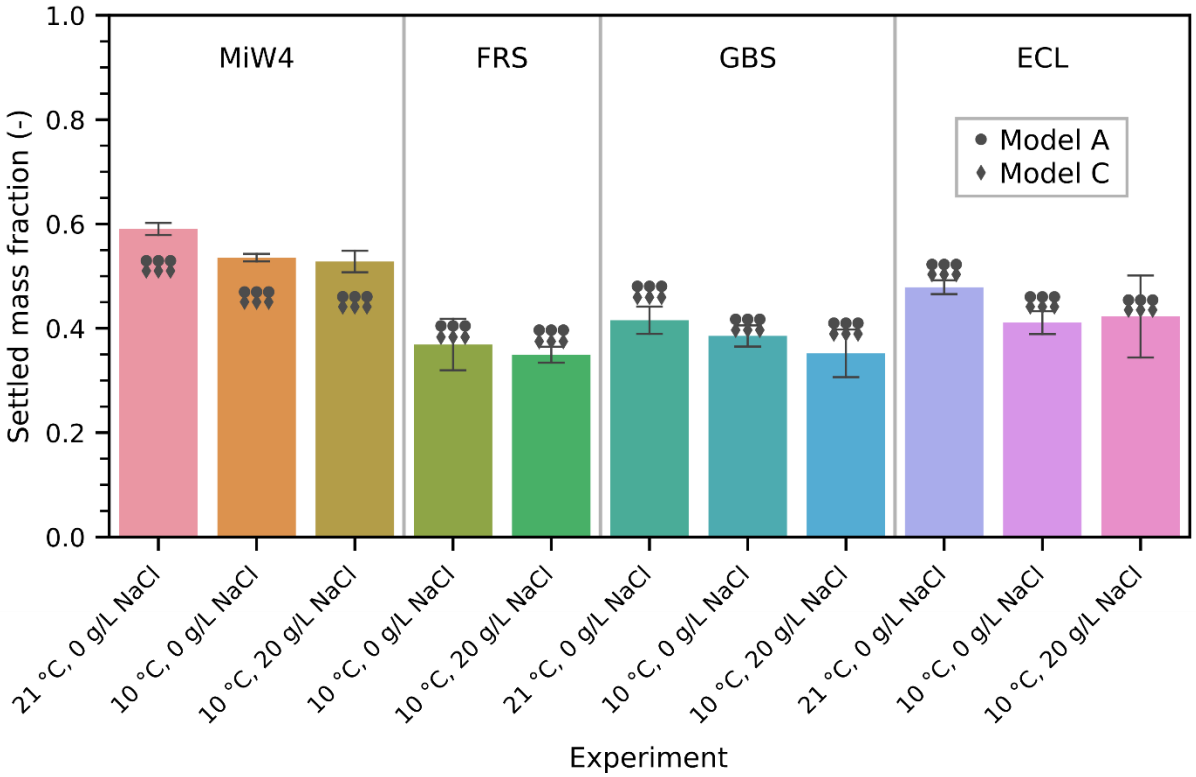

Figure S6. Settled mass fraction in the settling experiments with varying temperature (21 and 10 °C) and NaCl concentration (0 and 20 g/L), n=3 for each experiment. The error bars indicate the standard deviation. Experiment FRS, 21 °C, 0g/L was not conducted due to low sample quantity. Marker show the predicted settled mass fraction determined by Model A and C.

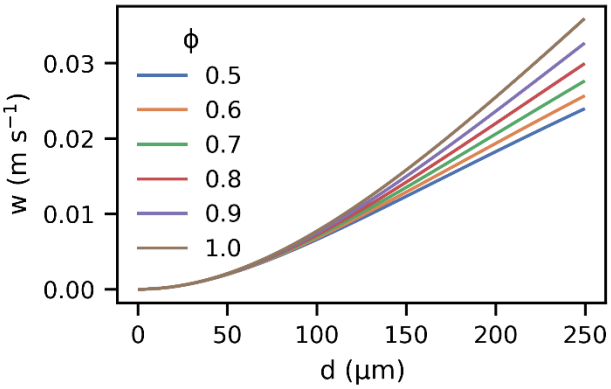

Figure S7. Settling velocity determined with the equations proposed by Haider and Levenspiel (model C) with respect to particle diameter and sphericity at 20 °C, ϱ_s of MiW4, and w_{NaCl}=0.