

One year analysis of sedimentation samples at Évora , Portugal

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Instrumentation and Methods

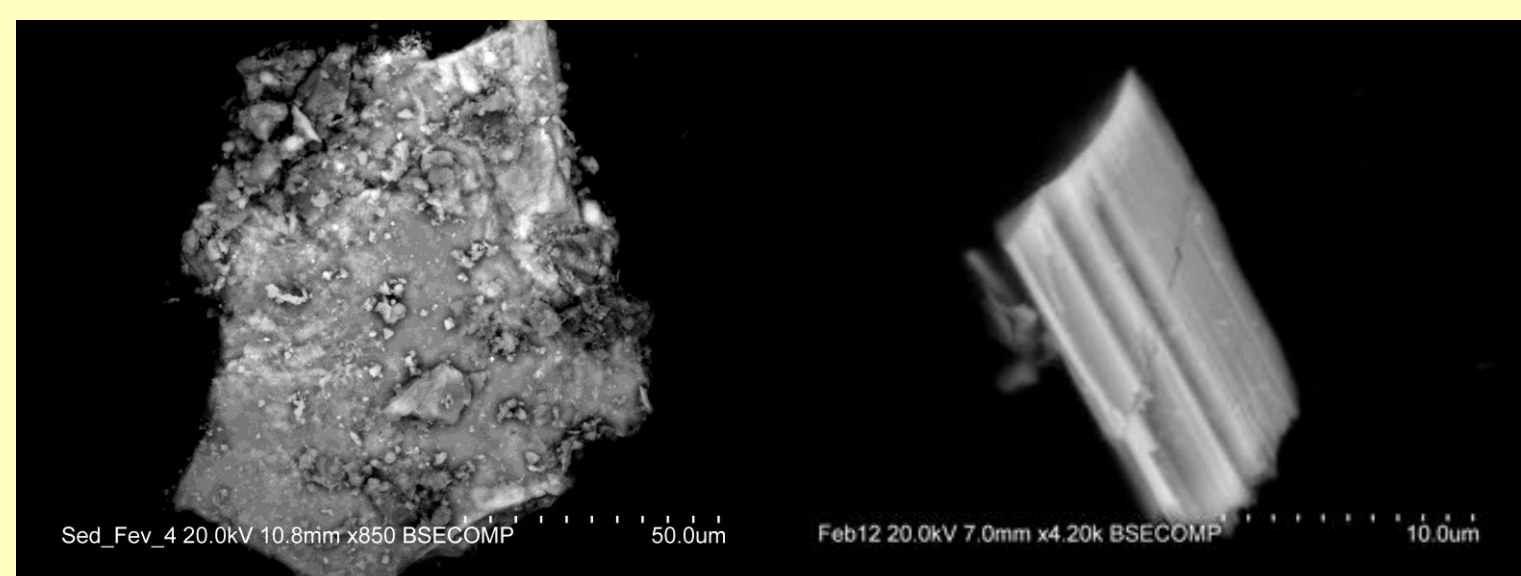


The particulate matter was collected on Aluminium stubs coated with carbon adhesives inserted into a modified version of the aerosol passive sampler Type A "flat plates" (left figure) with a temporal resolution of about 1 week.

The elemental analysis was done using an HITACHI VP-SEM (scanning electron microscope) interfaced with a Bruker EDS QUANTAX automatic ESPRIT software as well as FEI QUANTA 200 FEG.

About 1000 particles were analysed for each sample and particle size and elemental composition was determined. Based on a set of rules the elemental composition of each particle was transformed into 8 chemical classes. Additionally the particles were separated into 3 classes according to their size.

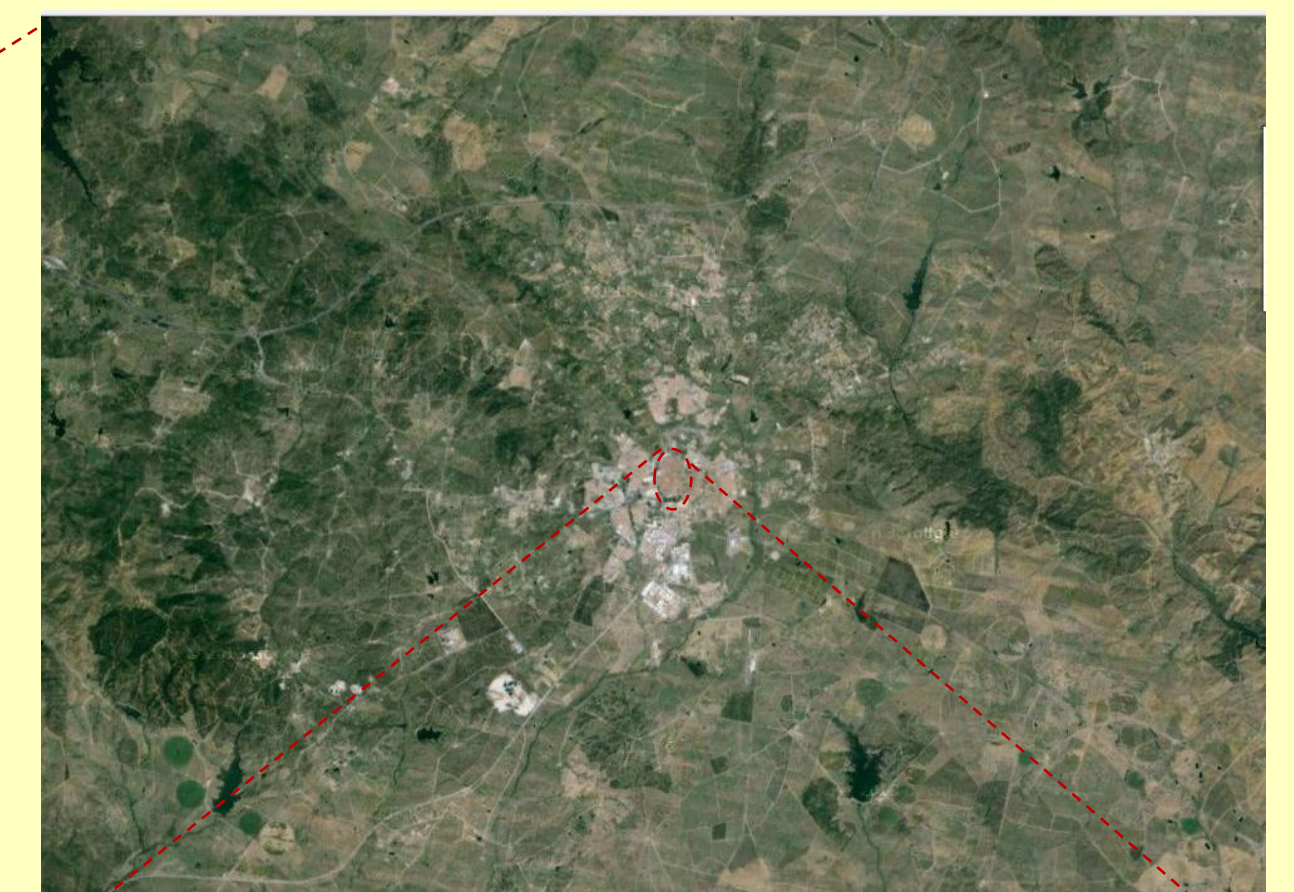
The two figures on the left show examples of SEM images of the particles.



Fe-rich particle

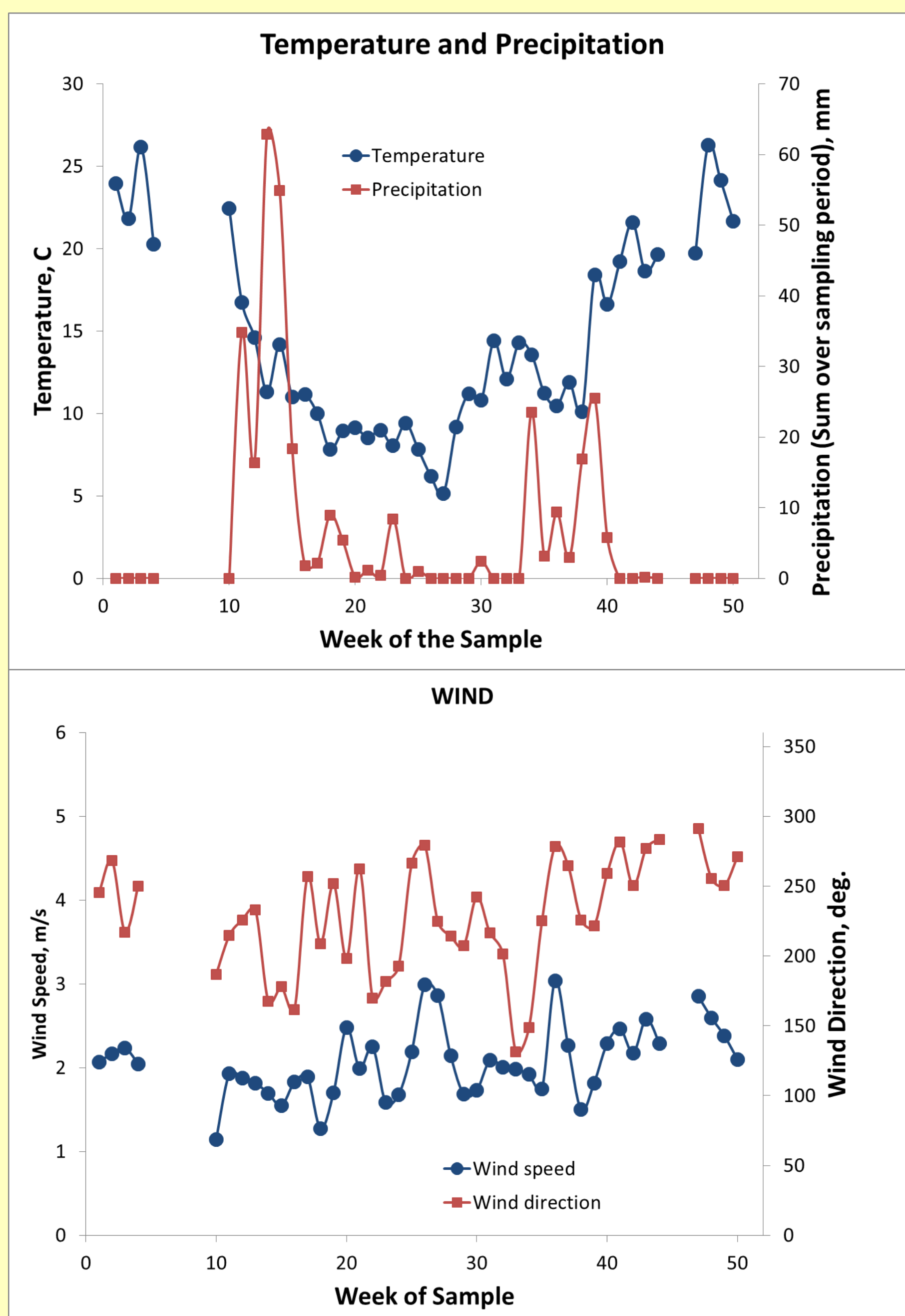
Aluminosilicate

Sampling Site

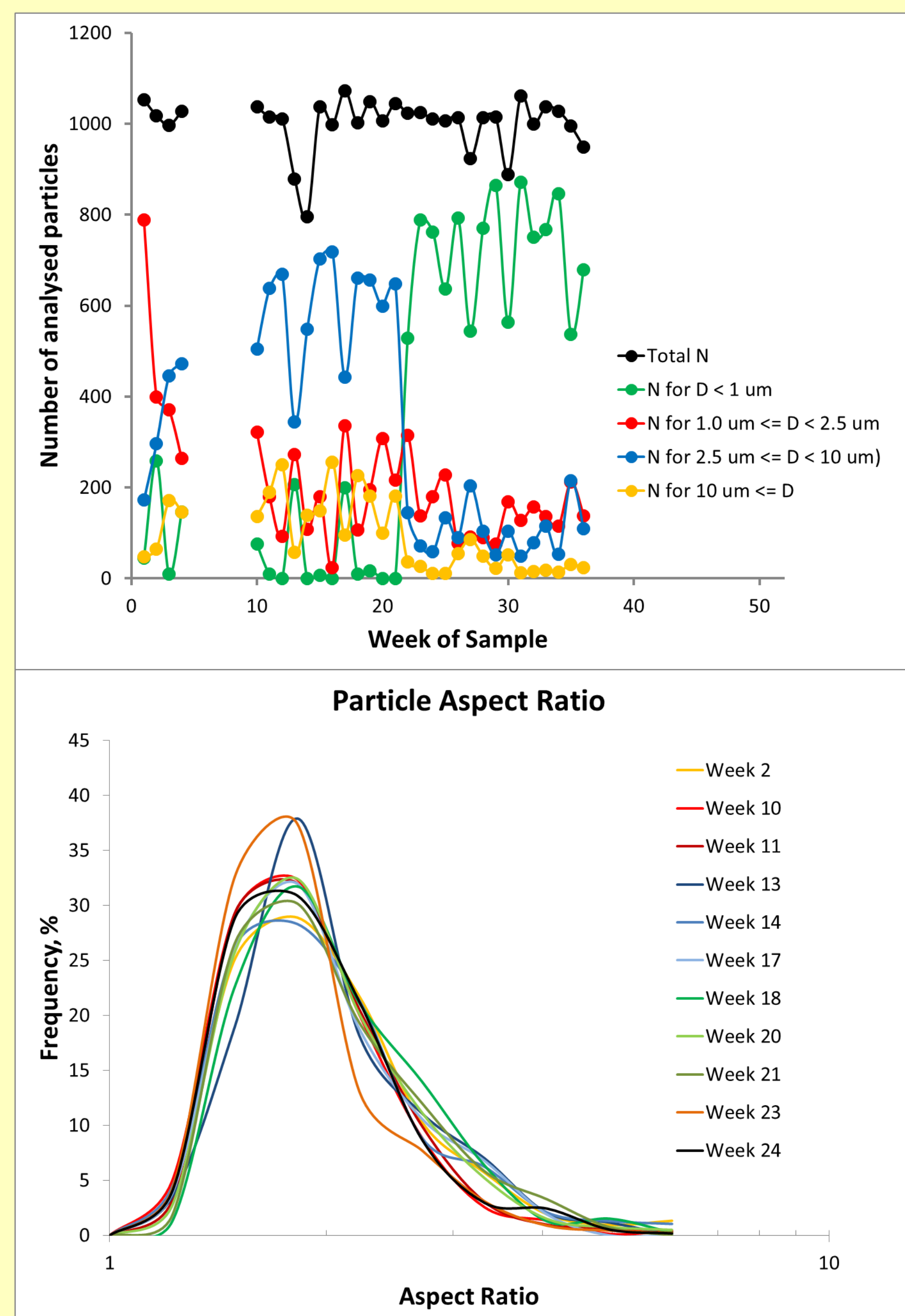


Évora is located in the mainland of Portugal about 150km away from the coast (Fig.). It is situated in a rural area without polluting industries (Fig.). The sampling site is at the Geophysics Center of Évora (CGE, 38.57°N, 7.91°W, 290 m a.s.l.) inside the historical center of Évora (Fig.).

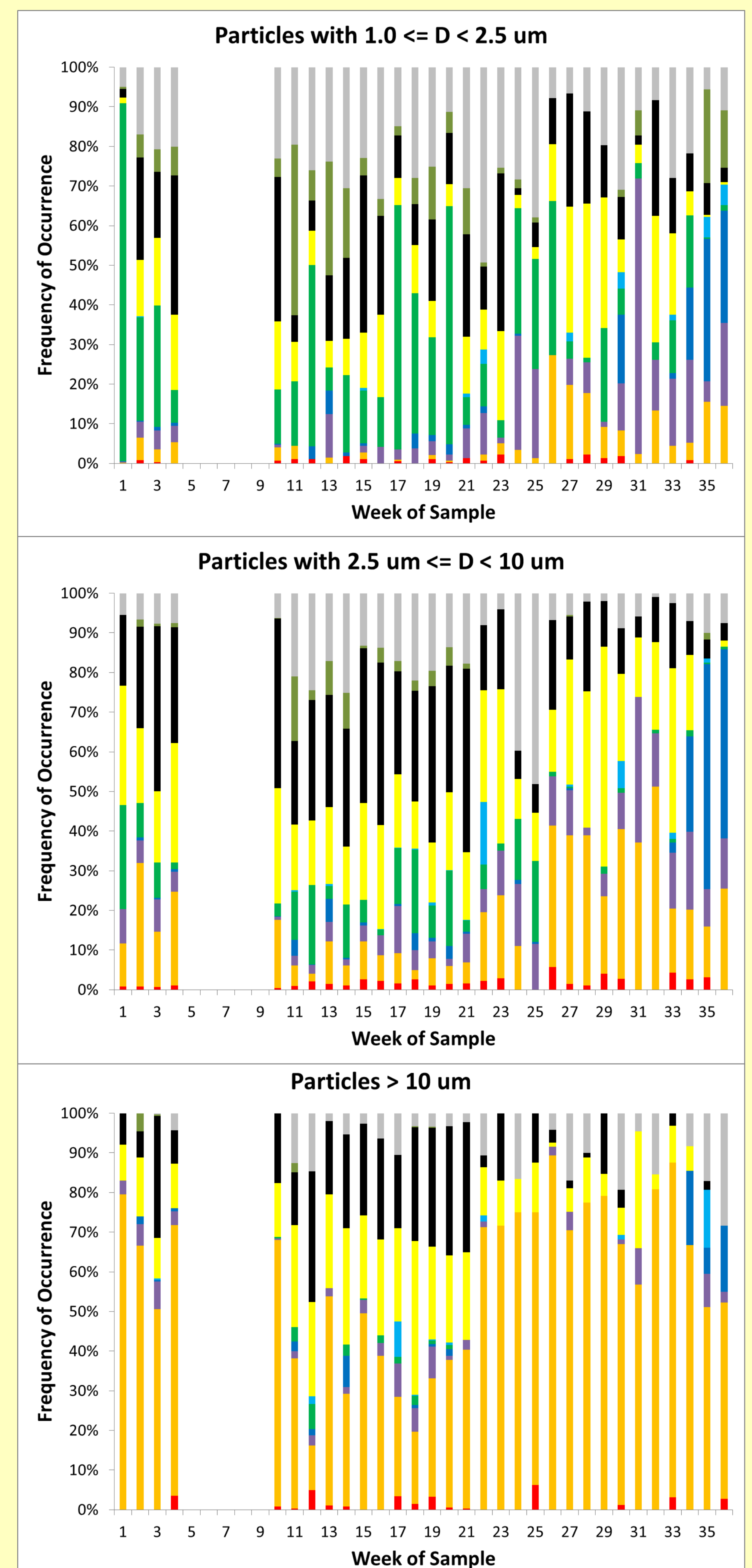
Meteorology



Measurement and Analysis Details



Results



Comments

- We changed the SEM data analysis protocol starting with week 22. Hence the chemical composition before and after this change can only be compared with utmost care.
- The aspect ratio distribution is very stable over time
- As expected soil material dominates the large particle size fraction
- Surprisingly few sea salt particles consisting only of Na and Cl were identified; instead, many Na- and S-rich particles were found, which show a molar Na/S ratio of approximately 2. It seems safe to assume that these particles have been sea-salt particles or droplets which were converted to sodium sulfate due to long exposure times (on sampler or already during transport in the atmosphere).
- Trajectory analysis was done but is not shown on this poster. For instance the abundance of sea salt particles which are clearly visible in the samples of weeks 34, 35, 36 are consistent with air parcels which were inside the boundary layer close to the Portuguese coast.

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