GROUP-HOMEWORK 2016 Water Quality Data Schleswig Holstein

You will get a set of data files:

1. The original water quality file as a “csv”-file.
2. An extracted cross-table with relevant parameters for analysis
3. A table with the parameter list and units
4. A table with the detection limits of the parameters
5. A table with the description of the monitoring stations (n=347)

Objective: Assessment of the water quality of Schleswig Holstein

Preparation: Study the tables.

Recalculate the coordinates into Decimal-Degree (XX°.yyyyyy) values.

Plot the locations. Study the depth of the wells and the filter units and make a statistic.

Study the geology and the groundwater aquifer description.

Tasks 1: Calculate the ion balance and compare with the values in the database. Evaluate the result and describe the difference between your calculation and the reported ion balance.

Task 2: Calculate the pCO2 of the water for all samples, where possible. Compare shallow and deep pCO2-values and try to identify differences in context of the geological setting.

Task 3: Calculate the saturation indices for calcite, amorphous silica, feldspar, and three probably abundant clay-minerals of your choice. The choice of the clay-minerals should be justified by a reference.

Are groundwater locations over- or -undersaturated? Make a statistic and plot the trend in a map.

Note for aluminosilicates you need datasets with Aluminium concentration. However, concentrations are often below the detection limit. In this case assume that half the detection limit is the estimated concentration.

Task 4: Plot trends for selected stations, which allow for time series analysis, for nitrogen and phosphor. Do you identify area with elevated and/or increasing nutrient concentrations?

Task 5: Identify locations where groundwater is exceeding drinking water limits for nitrate. Discuss your findings.