

# Water Quality Management you can depend on.

## WATER QUALITY

The European Framework Water Directive has significantly improved the quality of our bodies of water. Water management is now faced with new challenges which require the use of software to actively support the decision making process in water quality management. WISKI can now offer directly coupled quantitative and qualitative data through the WQM water quality module extension.

With WISKI WQM, you can record sample data manually or automatically, flexibly manage this data, evaluate and display it on a time series level, configure classification systems, configure substance, parameter, and comparison lists as well as data from measurement programs and data exports in various formats. Furthermore, WISKI WQM allows you to automatically generate maps of various qualities for bodies of water through a connection to a geographical data system.

## Key features

### WQM key list

The WQM key list facilitates flexible management of water quality parameters (e.g. ammonia content, PCP, and suspended matter, etc.) in substance lists. Quality parameters can be linked to alternative number systems (e.g. by country/state or EU lists), and the user is able to add new parameters where required. Descriptive

parameters may be maintained and added where required (e.g. colour, smell of sample, weather conditions when sample was taken). Furthermore, laboratory specific data such as sample preparation and analysis procedures can be maintained, and water quality parameters assigned uniquely.

### Parameter and comparison lists

To improve the handling, visualisation, and administration of what may be hundreds of water quality parameters, the parameters can be grouped together into parameter lists (e.g. nutrient, heavy metal, or pesticide content). The lists can be configured flexibly using a parameter filter. Comparison lists may also be configured when comparing measured values with guidelines or self-formulated thresholds. Upper and lower thresholds may be defined for the water quality parameters assigned to these lists.

### Configuration of measurement programs

Samples are typically organised in measurement programs. Therefore, it is possible to configure measurement programs directly in WQM, e.g. to assign attributes, parameters and comparison lists. Water quality measurement stations are assigned to these measurement programs, which in turn appear in the WISKI Explorer in display mode. Display mode provides access to the sample data, e.g. all descriptive, measured, or analysed data of a sample at each station.

### Sample Import

Sample data can be imported both automatically and manually. Import is not limited to measured and analytical values, but can also include verbal descriptions of the sample. Automatic import is carried using a highly flexible importer, which allows you to import any files in the Excel format, the standard format for sample data. An XML interface supports automatic imports of sample data from Laboratory Information Management Systems (LIMS).

### Sample data export

Sample data may also be exported, in addition to the export of time series data as pure WISKI functionality. This function supports the ASCII format required by the German Federal Environmental Agency (UBA). All parameters may also be exported as aggregated values, e.g. mean values, standard deviations, extreme values, and various percentiles. All sample data may also be exported in the XML format.

### Time series display

Time series display of all water quality parameters is carried out using an editing mode in the WISKI Explorer. In addition to the time series containing the measured values, time series with aggregated values are generated automatically. The calculation includes the mean value, standard deviation, extreme values and percentiles. The user can influence the calculation, e.g. set the amount of measurement or analysis values required for calculation, or the procedure used to calculate percentiles. LAWA requirements are set as defaults. The calculation and storage of additional, highly specific and derived parameters (for example ammonia content, pH values, and water temperature) may be carried out in KiBasic, the formula language developed by KISTERS specifically for the requirements of time series management.

### Load calculation

Each sample measurement with the mass per volume unit may be linked with arbitrary discharge values in order to calculate load values, for example the daily flow mean of the neighbouring river

gauge. A sample value may also be associated with virtual flows. This function can be useful if no measurements of the water level or flow have been carried out near the location where the sample was taken.

### Classification systems

Classification systems such as the German General Requirements for the Quality of Flowing Bodies of Water (AGA) or the substance related chemical quality of a body of water according to LAWA can be configured to classify a measured, analysis, or aggregated value (e.g. annual mean) into a schematic of the quality of a body of water. Class borders can be defined for all water quality parameters within these classification systems, and each class can be described both verbally and using colour. Measurement or analysis values can therefore be sorted into a water quality classification as a table or graph, both using keywords and visually.

### Visualisation

Sample visualisation is performed using traditional WISKI graphs. Additional features here are the display of water quality thresholds (from relevant lists), coloured backgrounds of the time series with a classification system and the separate display of samples which have undershot the detection limit.

### Water quality maps

Water quality maps are generated automatically based on the connection between WQM and ArcGIS. In addition to point displays (one parameter for each station) and diagram displays (several parameters per year or one parameter over several years per station), band displays are also available. Band displays allow for discharge overlaps (e.g. MQ) with water quality data expressed in colour, which in turn stems from a classification system defined in WQM.

Progress and success in water management:

**With WISKI WQM and the competence of pioneers.**