

A GRAPHICAL PRESENTATION OF WATER QUALITY DATA IN TIME AND SPACE

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ABSTRACT

The Dutch Association of Rhine Water works RIWA operates a monitoring network in the Dutch part of the Rhine basin. The purpose of this network is to assess compliance with specific standards and to determine trends over time.

Annual reports are produced to underline demands regarding measures towards an improved water quality.

In order to attain a more readily visualized presentation of water quality data, especially for decision makers who appear not to have a thorough experience in water quality issues we have developed a graphical presentation in which a two-dimensional array combines sampling locations and selected water quality variables. Colored squares indicate the violation of standards (values over target standard, red), full compliance (values below 80% of target standard, blue), or moderate compliance (values between 80% and target standard, yellow). An arrow indicates trends over a five year period. Area color coverage indicates the reliability of statements.

Compliance testing in our specific setting is based on maximum values, but could equally well be based on some percentile or average value.

For trend calculations a five-year dataseries for each variable is converted to quarterly averages, to reduce skewness and auto-correlation, and the resulting data are subjected to a trend analysis according to a modified linear regression model. This yields either a decreasing trend (worsening, at least for most variables, thus an upward arrow), an increasing trend (improving, thus a downward arrow) or no trend (stable, thus a horizontal line).

By combining sampling sites along a river with selected water quality variables, the water quality changes along that river can easily be presented.

It should be emphasized that this graphical presentation serves illustrative purposes only. An added advantage is the possibility to detect odd values indicating erroneous data or unexpected events within the water body. Since such values may show up as an odd color within a series of otherwise identical colors, they are much more readily noted than by scrupulous and tiresome screening of individual data records.

The software was home-built in MS-Access and similar approaches should not be too complicated to construct.

KEY WORDS data presentation, graphic display, trends, compliance.