DATA MANAGEMENT

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Data Management

Data Storage and Validation

- A recommended format for recording data is given in EDB. It includes all parameters, except heavy metals and trace organics, that may be analysed in the water quality monitoring programme currently envisaged. Note that ordinarily a sample would NOT be analysed for all the listed parameters in EDB.

- Record of analyses for heavy metals and trace organics, which would be performed on a limited number of samples, would be kept separately in a similar format.

Data Validation

Absolute checking/Data entry

- Checking if data is within the detection limits of a particular method
- Checking if the data is within the expected ranges for a parameter
- Checking if there are too many (or too few) significant digits reported
- Checking if data are physically or scientifically possible (general checks)
- Checking correlation of parameters (Some conditional checks like BOD/COD relation, TC/FC relation)
- Checking the correlation between EC and TDS
- Checking cation/anion balance
- Total coliforms must be greater than faecal coliforms
- Total iron must be greater than dissolved iron
- Total phosphorus must be greater than dissolved (ortho-)phosphorus
- Total iron must be greater than dissolved iron

General checks

- Total solids ≥ Total dissolved solids
- Total solids ≥ Total settleable solids
- COD > BOD
- Total Coli ≥ Faecal Coli
- Total Iron ≥ Fe+2, Fe+3
- Total P ≥ PO4-3
- EC (µS/cm) ≥ TDS (mg/l)
- Total oxidized nitrogen ≥ Nitrate, nitrite
- Total oxidized nitrogen = Nitrate + nitrite
- Total hardness = Ca hardness + Mg hardness

Conditional Checks

When there are known correlations between one or more water quality parameters these can be used to

Some of the more well known correlations between parameters are:

- Total dissolved solids specific conductance30
- pH and carbonate species
- pH and free metal concentrations
- Dissolved oxygen and nitrate
- If pH <8.3 then Carbonate = 0
- If DO = 0, then nitrate = 0
- If DO >0, then nitrate >0
- If DO > 7m, then ferrous ions = 0
- If nitrite >0, then ferrous ions = 0
- If ferrous ions >0, then nitrite = 0

Data Analysis and Presentation

It is often useful to subject data to some simple statistical analysis. It may be, for example, that such an analysis could be used to summarise the data; to transform them to aid understanding or to compare them with a water quality standard that is couched in statistical terms (annual mean, standard deviation, trend, seasonal changes or a percentile for certain parameters). The data can also be summarized in form of index. Statistical analysis like parametric correlation, seasonal fluctuations, seasonal trends over a period of time are also common. The data after analysis can be presented in different format. For a river usually river profiles are commonly presented. For groundwater contours are plotted over a geographical area.

Graphical Presentation

1. Time Series Graphs
2. Histograms
3. Pie Charts
4. Profile Plots (river profiles)
5. Geographical Plots (contours)

Data Interpretation

The data interpretation involves understanding on the water chemistry, biology and hydrology. Normally data analysed and interpreted in terms of chemical quality, quality fluctuations, and their possible effect on different uses and ecosystem. A comparison is made with predefined criteria or standards set for protection of different uses. The quality fluctuation are explained in view of possible sources of pollution and their fates in aquatic environment and their effects.


Thank You