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# Water Quality Monitoring

A practical guide to the design and implementation of  
freshwater quality studies and  
monitoring programmes

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## Chapter 3

### DESIGNING A MONITORING PROGRAMME

The design of a monitoring programme should be based on clear and well thought out aims and objectives and should ensure, as far as possible, that the planned monitoring activities are practicable and that the objectives of the programme will be met.

It is useful to prepare a programme document or study plan, which should begin with a clear statement of the objectives of the programme and a complete description of the area in which the monitoring is to take place. The geographical limits of the area, the present and planned water uses and the present and expected pollution sources should be identified. Background information of this type is of great help in preparing a precise description of the programme objectives and in deciding on some of the elements of the study plan. Subsequent sections of the study plan should cover the locations and frequency of sampling and the variables for analysis. The plan should also specify whether the analyses will be done in the field or in the laboratory. This decision must take into consideration the resources available for all the necessary field and laboratory work, data handling, analysis and interpretation, and the preparation and distribution of reports.

The principal elements of a study plan are:

- a clear statement of aims and objectives,
- information expectations and intended uses,
- a description of the study area concerned,
- a description of the sampling sites,
- a listing of the water quality variables that will be measured,
- proposed frequency and timing of sampling,
- an estimate of the resources required to implement the design, and
- a plan for quality control and quality assurance.

#### 3.1 Purpose of monitoring

The principal reason for monitoring water quality has been, traditionally, the need to verify whether the observed water quality is suitable for intended uses. However, monitoring has also evolved to determine trends in the quality of the aquatic environment and how the environment is affected by the release of contaminants, by other human activities, and/or by waste

*This chapter was prepared by A. Mäkelä and M. Meybeck*