Investigating Water Quality and General Health Downstream
Freshwater invertebrate sampling

Aims

- To investigate the biotic component of a river downstream
- To investigate the effect of the physical characteristics of a river on invertebrates, downstream
- To investigate the impact of human activities on freshwater ecosystems
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Equipment

- Waders
- Nets
- Trays
- Plastic spoon
- ID charts or keys
- Record sheets

Methodology

- Kick sampling - A net placed on river bed and the area just upstream is disturbed by a gentle kicking motion with the foot
- Sweep netting - The net is swept back and forth gently in a figure of eight motion

The sample collected is places into a tray of shallow water, and species can be identified using a chart or a key.

Considerations and possible limitations

- Access to desired parts of the river may be problematic
- It is important to consider the sampling method, including the locations chosen for sampling and the length of time to kick or sweep for
- The accuracy of visual observations and identifications must be taken into account

Using the data within an investigation

- Data should be used in conjunction with other information, for example with water quality to investigate the impact of human activity on water quality and freshwater invertebrate populations

Water quality measurements

Aims

- To investigate any changes in water quality along the course of a river
- To compare different rivers in different catchments with different land use to determine the impact of human activities on water quality
- To investigate how water quality is managed

Equipment

- Thermometer
- Hatch kits to investigate dissolved nitrates and phosphates
- Dissolved oxygen digital meter
- pH meter
- Alternatively a wide variety of dip tests can be used

Methodology, considerations and limitations

Sites should be identified using an appropriate sampling strategy. At each site, the following data can be collected:

1. **Water temperature**, using a thermometer
2. **Dissolved nitrates and phosphates,** using hatch kits

3. **Dissolved oxygen,** using a digital dissolved oxygen meter. Alternatively, the Winkler method of estimating oxygen content can be applied.
4. **Water pH.** A digital PH meter is the easiest to use, although accuracy can be affected by poor calibration and low batteries

Considerations and possible limitations

- When measuring water temperature, it is important to ensure that the temperature of the surrounding air does not influence the readings. Shallow or surface readings are more likely to be affected by air temperature
- Hatch kits used to measure dissolved nitrates and phosphates can be expensive, and small amounts are undetectable
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Using the data within an investigation

- Data can be used in conjunction with land use mapping in the river catchment area to determine the extent to which water quality is affected by different human activities. If water quality samples are taken along the length of the river, it may be possible to connect water quality to specific human activities
- Secondary information from organisation such as The Environment Agency and Natural England, and local newspaper articles, can be used to link water quality with any existing local water management strategies

Adapted from rgs.org