
**Water quality — Guidance on marine
biological surveys of hard-substrate
communities**

*Qualité de l'eau — Lignes directrices pour les études biologiques
marines des peuplements du substrat dur*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 19493 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 230, *Water analysis*, in collaboration with Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 5, *Biological methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Introduction

Surveys of benthic marine algae and fauna on hard substrates represent an important part of marine environmental surveys. The species composition, both in terms of the species present and their relative abundances, is a result of the natural and anthropogenic environmental factors at the survey site. Natural factors that influence species composition include wave exposure, depth, salinity, nutrient level, type of substrate, slope, orientation, turbidity, current, temperature and grazing. Anthropogenic factors include pollution (e.g. oil, contaminants, particles), physical disturbance, elevated nutrient levels and effects from fisheries.

A number of different methods are being used to investigate flora and fauna on hard substrate according to the survey aim and the type of biotope surveyed. To allow environmental authorities and others to make use of this knowledge, it is essential that surveys are intercomparable in time and space, as well as between operators, and that the data are of a high quality. This International Standard is based on a limited selection of methods that allow precise documentation, that are replicable and which have been tested over many years. In choosing methods for this standard, semi-quantitative and quantitative techniques have been emphasized, such that species and quantities can be related to a known area of sea floor.

For the purposes of this International Standard, hard substrate is defined as bedrock, stable rocks and fixed marine constructions (e.g. pipelines and quays). The main focus is on biological surveys based on species that can be recorded in the field (i.e. that are visible to the naked eye).

The guidelines are applicable to seagrass communities and their epiflora and epifauna. They can also be used for surveys of stable substrates comprising loose pebbles/boulders, stone blocks, coarse gravel and other loose material as well as bedrock covered with loose sediment, but in general, such substrates require specially adapted techniques. Additional methods are usually required for surveys in depths greater than approximately 30 m.

For sediment sampling in marine areas, refer to ISO 5667-19. For surveys of sublittoral soft-bottom fauna, see ISO 16665.

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Water quality — Guidance on marine biological surveys of hard-substrate communities

1 Scope

This International Standard provides guidance for marine biological surveys of supralittoral, eulittoral and sublittoral hard substrate for environmental impact assessment and monitoring in coastal areas.

This International Standard comprises

- development of the sampling programme,
- survey methods,
- species identification, and
- storage of data and collected material.

This International Standard specifies the minimum requirements for environmental monitoring.

The methods are limited to surveys and semi-quantitative and quantitative recording techniques that cause little destruction of the fauna and flora. In practice, this refers to direct recording in the field and photography. Sampling by scraping off organisms, use of a suction sampler, etc. are not covered in this International Standard, but such techniques can be used as a supplement to obtain information on small-sized species or those that live hidden.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

area of influence

area influenced or expected to be influenced, based on the available information

2.2

biotope

area of uniform environmental conditions (habitat) and its characteristic assemblage of plant and/or animal species

EXAMPLE *Laminaria hyperborea* community (cuvie or tangleweed), knotted wrack community, blue mussel belt.

2.3

macroscopic organisms

algae and animals that are visible without magnification equipment (≥ 1 mm) and which can be recorded in the field

NOTE Certain macroscopic organisms can require microscopic inspection for identification. For microscopy of collected material, the lower size limit is set to 1 mm.