SLOVENSKI STANDARD

SIST EN 14996:2006

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Kakovost vode - Navodilo za zagotavljanje kakovosti biološkega in ekološkega ocenjevanja v vodnem okolju

Water quality - Guidance on assuring the quality of biological and ecological assessments in the aquatic environment

Wasserbeschaffenheit - Anleitung zur Qualitätssicherung biologischer und ökologischer Untersuchungsverfahren in der aquatischen Umwelt

Qualité de l'eau - Guide d'assurance qualité pour des évaluations biologiques et écologiques dans l'environnement aquatique

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English Version

Water quality - Guidance on assuring the quality of biological and ecological assessments in the aquatic environment

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This European Standard was approved by CEN on 3 May 2006.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14996:2006) has been prepared by Technical Committee CEN/TC 230 “Water analysis”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

SAFETY PRECAUTIONS — Safety issues are paramount when surveying surface waters. Surveyors should conform to EU and national Health and Safety legislation and any additional guidelines appropriate for working in or near water.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The importance of ecology in new legislation such as the EC Water Framework Directive (WFD 2000/60/EC) means that ecological data from aquatic environments shall be of a known and verifiable quality. General guidelines on quality assurance are given in the EN ISO 9000 series and, especially, EN ISO/IEC 17025. This guidance standard is designed to complement these standards by providing advice specific to the quality assurance of ecological data collected from aquatic environments. The principles outlined in this standard are applicable to all field and laboratory work and to all organisations producing ecological data.

According to the precise use to which this standard is to be put, it is essential for specifiers and users to agree on any necessary variations or optional procedural details prior to use.

1 Scope

This guidance standard defines activities appropriate for ensuring that the quality of ecological assessments in surface waters (including rivers, lakes, transitional and coastal waters and the open sea) and sediments meets specified requirements. This standard also covers hydromorphological aspects relevant to ecological assessment. While it has particular importance in relation to the assessment of ecological status in surface waters, it also applicable to other types of investigation and habitat.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Not applicable.

3 Terms and definitions

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

3.1
accuracy
closeness of agreement between the result of a measurement and the true value of the measurand

NOTE 1 Accuracy consists of bias (systematic error) and random error.

NOTE 2 The true value is a value that would be obtained by a perfect measurement, thus true values cannot be determined and, consequently, accuracy is generally a hypothetical concept. In specific cases a 'true' value of a sample might be derived from interlaboratory studies as the mean value of all participants. This value should be regarded as a relative true value. For the purpose of this standard, accuracy can also refer to the application of the correct biological name to an organism.

3.2
bias
errors that are consistent rather than random in nature. Average of an infinite number of measurements of the same measurand under the same conditions divided by the true value of the measurand

NOTE 1 As only a limited number of measurements can be performed bias can only be estimated.

NOTE 2 Often referred to as 'systematic error'.

3.3
detection limit of discrete entities
minimum number and/or size of a specific taxon or group of organisms in a sample at which its presence can be detected with a certain confidence

3.4
error
difference between an individual result and the average (random error)

3.5
fitness for purpose
extent to which the performance of a protocol matches the criteria that best describes the end-user's need

NOTE Fitness should normally be assessed by a validation study.

3.6
metadata
summary information about data covering: how they were created, composition, limits of interpretation, quality of data, ownership and availability

3.7
measurand
particular quantity subject to measurement

NOTE In biological investigations, this refers to the number of organisms in a sample or percentage of covering of macrophytes.

3.8
performance characteristics
characteristics of a specific method or protocol, which encompass qualitative and quantitative aspects of data such as detection limit, repeatability, reproducibility, precision, uncertainty, bias, method sensitivity, measurement range, interference and recovery

3.9
phenology
study of changes in the morphology or physiology of organisms that occur over the course of a year in relation to internal or external stimuli (e.g. time of flowering in relation to climate)

3.10
precision
closeness of agreement between independent results obtained under the same conditions

NOTE Precision depends only on the distribution of random errors and does not relate to the true value or the specified value.

3.11
quality
all the features and characteristics of a measurement result that bear on its ability to satisfy stated or implied needs

3.12
quality assurance
all those planned and systematic actions necessary to provide adequate confidence that a product will satisfy given requirements of quality

NOTE This includes AQC, audit, training, documentation of methods, calibration schedules, etc.

3.13
quality control
operational techniques and activities that are used to fulfil requirements for quality

3.14
random error
difference between the result of a measurement and the average value obtained by an infinite series of measurements of the same measurand under the same conditions

NOTE As only a limited number of measurements can be performed a random error can only be estimated.

3.15
recovery
fraction of a measurement component that is detected by the analysis

NOTE This is often determined after addition of a known quantity of the measurement component.

3.16
reference collection
collection of live or preserved specimens, whose identities have been confirmed independently, that is accessible to an analyst to aid in the identification and analysis of ecological samples

NOTE A reference collection may also take the form of photographs or digital images.

3.17
repeatbility (of results of measurement)
closeness of the agreement between the results of successive measurement of the same measurand carried out under the same conditions of measurement

3.18
reproducibility (of results of measurement)
closeness of the agreement between the results of measurement of the same measurand carried out under changed conditions of measurement. (observer, time, location, instruments etc.)

3.19
statistical power
ability of a statistical procedure to distinguish a situation different from the null hypothesis (H_0: no difference, no effect or no change)

NOTE In statistical terms: statistical power = (1-β) in which β is the probability of failing to reject H_0 when in fact H_0 is false.

3.20
taxon (pl. taxa)
group of organisms related at a particular taxonomic level

3.21
taxonomic expert
individual recognised by his/her peers as having particular taxonomic skills or knowledge

3.22
taxonomic level
precision with which an organism is defined, for example family, genus or species

3.23
uncertainty
parameter associated with the result of a measurement that characterises the dispersion of the values that could reasonably be attributed to the measurand

NOTE Generally the parameter consists of a standard deviation. For most purposes an expanded uncertainty should be used obtained by multiplying the combined standard uncertainty by a coverage factor (k). For an approximate level of confidence of 95 %, k is 2 ($n > 7$, t-Statistics). The combined standard uncertainty is the result of a series of measurements in which the contribution of all relevant sources of uncertainty (both random and systematic) are combined.

3.24
validation (of a method)
confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application are fulfilled

3.25
verification
confirmation of an identification, e.g. by a qualified person or an independent expert