SLOVENSKI STANDARD
SIST EN 16503:2014

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Kakovost vode - Navodilo za ocenjevanje hidromorfoloških značilnosti somornic in obalnih morij

Water quality - Guidance standard on assessing the hydromorphological features of transitional and coastal waters

Wasserbeschaffenheit - Anleitung zur Beurteilung der hydromorphologischen Merkmale der Übergangs- und Küstengewässer

Qualité de l'eau - Norme guide pour l'évaluation des caractéristiques hydromorphologiques des eaux de transition et des eaux côtières

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13.060.10	Voda iz naravnih virov	Water of natural resources
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EUROPEAN STANDARD

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Water quality - Guidance standard on assessing the hydromorphological features of transitional and coastal waters

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

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Contents

Page

Foreword

This document (EN 16503:2014) 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of an identical text or by endorsement, at the latest by February 2015 and conflicting national standards shall be withdrawn at the latest by February 2015.

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Introduction

Hydromorphology of transitional and coastal (TraC) waters is one of the basic features of marine and coastal ecosystems controlling the presence of biota. Hydromorphology is the result of the interaction between the structure of the systems and their functioning. Structure includes sea-bed geology, sediment features, morphology and water depth, whereas functioning includes hydrodynamics, sediment dynamics and morpho-dynamic processes.

Over the past several millennia, human developments in TraC waters throughout Europe have caused substantial changes in the hydromorphological characteristics and ecological functioning of many water bodies. Hydromorphological changes are an important consideration in implementing the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD). In addition, for the Habitats Directive there is a need to maintain certain 'features' in favourable condition, which has also given rise to a focus on hydromorphological assessments.

In a general sense, transitional waters (e.g. estuaries, fjords, some lagoons) are neither fully open coastal systems nor enclosed or flowing freshwater areas. (for the WFD definition, see Clause 2). Their boundaries may be defined by hydromorphological features and discontinuities, by salinity, or by any other hydrographic feature (e.g. water depth and tidal regime). The term 'coastal waters' has been defined for various legal and political purposes (e.g. see Clause 2) but in this hydromorphological standard they are defined as waters characterized by coastal features and influenced by coastal processes.

This European Standard:

a) supports environmental and conservation agencies in meeting monitoring requirements of the WFD and MSFD;

b) provides information supporting other environmental reporting requirements (e.g. in relation to biodiversity or environmental impact assessment);

c) supports management and restoration initiatives;

d) identifies and defines the main pressures affecting European TraC waters.

Note that in this standard, "assessment" is used as a broad term referring to the general description of features and the pressures that impinge upon them. It is not used to imply the judgement of particular levels of "quality" or "value", whether related to status under the WFD, MSFD or more generally.

WARNING — Persons using this European Standard should be familiar with usual laboratory and fieldwork practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

IMPORTANT – It is absolutely essential that tests conducted according to this European Standard be carried out by suitably trained staff.

1 Scope

This European Standard gives guidelines for characterizing the hydromorphology of transitional or coastal (TraC) waters, but does not prescribe detailed methods of assessment. The main aim of this document is to improve the comparability of hydromorphological survey methods, data processing, and the interpretation and presentation of results.

This European Standard:

a) lists essential features and processes of TraC waters that should be characterized as part of a hydromorphological survey and used for determining hydromorphological condition;

b) gives guidance on strategies for collecting and presenting hydromorphological data depending on the resources available and the anticipated use of the assessment;

c) describes how to generate data sets appropriate for monitoring and reporting on the condition of Natura 2000 sites designated under the Habitats Directive and the Birds Directive;

d) provides guidance on data quality assurance.

This European Standard does not deal with biological assessments in TraC waters such as the presence or absence of individual species or community composition, nor does it attempt to link specific hydromorphological features with their associated biological communities. However, it is relevant where plants or other organisms form significant structural elements of the habitat (e.g. saltmarshes, biogenic reefs).

2 Terms and definitions

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

2.1
aquatic macrophyte
larger plant of marine and brackish water which is easily seen with the naked eye, including angiosperms and macroalgae

EXAMPLE Examples for angiosperms: reeds, saltmarsh and seagrass beds; example for macroalgae: seaweed.

[SOURCE: EN 16039:2011, 3.1, modified]

2.2
attribute
specific recorded elements of a hydromorphological feature

EXAMPLE ‘Silt’ and ‘boulders’ are natural substrate texture attributes, ‘sheet piling’ and ‘gabions’ are attributes of engineered banks.

[SOURCE: EN 16039:2011, 3.2]

2.3
bay closing line
straight line drawn between prominent physical features on either side of a bay

2.4
bedform pattern
morphology of the seabed

Note 1 to entry: The bedform patterns may be simple or complex depending on the size and shape of the system and the nature of the local sediment transport processes. Deposition produces features such as sand and gravel bars, while erosion results in scour features.

2.5
biogenic reef
mass consisting of the hard parts of organisms, or of a biogenically constructed frame enclosing detrital particles, in a body of water

Note 1 to entry: Most biogenic reefs are made of corals or associated organisms.

2.6
coastal cell
length of coastline confined by natural or artificial barriers across which little or no sediment is transported

2.7
coastal plain estuary
submerged coastal river valley

2.8
coastal water
body of surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters

Note 1 to entry: This definition from Article 2 of the EC Water Framework Directive (2000/60/EC) is one example of a definition of 'coastal water' used for legal purposes.

2.9
connectivity
linkage within and between water bodies through exchange of water, sediment and organisms

2.10
ecological status
expression of the quality of the structure and functioning of aquatic ecosystems, by comparing the prevailing conditions with reference conditions

Note 1 to entry: As classified in accordance with Annex V of the EC Water Framework Directive (2000/60/EC).

[SOURCE: EN 16039:2011, 3.15]

2.11
fetch
fetch length
distance of open water over which the wind can blow and generate wind-driven waves

[SOURCE: EN 16039:2011, 3.19, modified — "fetch length" was added as synonym]

2.12
fjord
long narrow and glacially eroded inlet with steep sides, created in a valley often with a shallow entrance at the mouth

2.13
headland
promontory of land projecting into water

[SOURCE: EN 16039:2011, 3.20]

2.14
highest astronomical tide
HAT
highest tide that can be expected to occur under average meteorological conditions and at the spring and autumn equinox

2.15
hydromorphology
physical, hydrological and hydrodynamic characteristics of transitional and coastal waters including the underlying processes from which they result

[SOURCE: EN 16039:2011, 3.22, modified]

2.16
intertidal area
foreshore
zone between high and low tide lines

2.17
lagoon
expanses of shallow coastal salt water, of varying salinity and water volume, wholly or partially separated from the sea by sand banks or shingle, or, less frequently, by rocks

Note 1 to entry: The EC Water Framework Directive (2000/60/EC) classifies lagoons as 'transitional waters'.

2.18
micro-tidal
tidal range < 2 m

2.19
mixing
blending of waters of different characteristics (e.g. temperature, turbidity, salinity) by turbulence and diffusion, caused by tides, winds, waves, currents and river runoff

2.20
normal tidal limit
NTL
point at which the level of a river or stream ceases to be affected by the tidal flow

2.21
physiography
prominent coastal landform features

2.22
planform
view of transitional or coastal water body from above

EXAMPLE Sinuous, straight.

2.23
reef
ridge of rock, or other material, lying seawards of the low water line

2.24
reference condition
condition which is totally or nearly totally undisturbed by human activity

2.25
residence time
retention time
length of time it takes for a transitional water, sea loch or fjord to exchange its water

Note 1 to entry: For enclosed bays “retention time” is the preferred term.

2.26
saltmarsh
area having characteristic vegetation adapted to saline soils and to periodic inundation by sea water

2.27
sandbank
low-energy feature created at the mouth of a river where it flows into the sea

Note 1 to entry: Characteristic of the coast, often poorly defined.

2.28
storm surge
change in water level as a result of meteorological forcing (wind, high or low barometric pressure) additional to the astronomic tide; it may be positive or negative

2.29
stratification
layering of water column due to density differences resulting from changes in temperature, turbidity or salinity with depth

2.30
substrate
rocky or sedimentary material making up the bed of a transitional or coastal water body

2.31
subtidal area
zone seawards below the mean low tide line

2.32
tidal prism
volume of water that flows into a tidal channel on the flood tide

[SOURCE: EN ISO 772:2011, 2.49]

2.33
tidal range
difference in level between high water and low water of a tide

[SOURCE: EN ISO 772:2011, 2.50]

2.34
tidal regime
parameters characterizing tides including levels, periods, frequencies, harmonics, phases and spectra

2.35
tidal bore
tidal phenomenon in which the leading edge of the incoming tide forms a “wave” (or waves) of water that travel up a narrowing estuary or bay against the direction of the river or bay's current

2.36
topography
bathymetry
sea-bed level with reference to a given elevation

2.37
transitional water
body of surface water in the vicinity of river mouths which is partly saline in character as a result of their proximity to coastal waters but which is substantially influenced by freshwater flows

Note 1 to entry: In accordance with Article 2 of the EC Water Framework Directive (2000/60/EC).

2.38
turbidity
reduction of transparency of a liquid caused by the presence of suspended particulate matter

[SOURCE: ISO 6107-2:2006, 145]

2.39
wave exposure
wave energy environment of a shoreline

Note 1 to entry: An important variable, along with substrate composition and water depth, that influences the habitat characteristics of the shoreline.

2.40
wetland
habitat occupying the transitional zone between permanently inundated, and generally dry, environments

EXAMPLE Saltmarsh or wetland fed by groundwater.

[SOURCE: EN 14614:2004, 3.42, modified]

3 Principle

A standard protocol is described for recording the physical features of TraC waters. The range of features, and the methods used for survey, may vary according to the type of water body and the objectives of the study. This European Standard provides a general framework for these different methods, details of which can be found in the references cited in the Bibliography. It relies on a combination of measurements, models and expert judgement, which in turn will help to improve the current state of knowledge of this subject area.

Guidance is given on the hydromorphological features that should be used for characterizing TraC water-body types and for further assessment of hydromorphological integrity through comparisons with reference conditions. The selection of features for survey will depend upon the type of pressures affecting the hydromorphology of a water body and the impacts they may cause, taking account of its particular hydromorphological context.