bENC Feature Catalogue

Edition 1.0

2014-12-04

Introduction

The bENC Feature Catalogue is based on features, attributes and enumerations of following Data Dictionaries

Data Dictionary Name	Token	Owner	Place of Publishment
HYDRO Data Dictionary	HYDRO	IHO	http://registry.iho.int
IENC Data Dictionary	IENC	IEHG	http://registry.iho.int

Used Abbreviations

Feature Types

G	Geo
M	Meta
C	Cartographic
O	Collection
I	Information

Feature Primitives

P	Point
L	Line
A	Area
N	None

Use of Feature Attribute Bindings

O	optional
M	mandatory
C	conditional mandatory

Type of Attribute Use

F	Feature
N	National
S	Spatial
C	Cartographic

Type of Attribute Value

E	Enumeration
L	List
F	Float
I	Integer
T	Text
S	Structured text

Feature	Depth area

Acronym: **DEPARE** Code: 42

Type: G

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: A depth area is a water area whose depth is within a defined range of values.

Remark: Intertidal areas are encoded as depth areas. These do not have to include soundings. The depth range within a depth area is defined by the attributes 'DRVAL1' and 'DRVAL2'.

Attribute Bindings:

acronym	usage	constraints
DRVAL1	M	unit = " m,ft " decimal digits = " 2 "
DRVAL2	M	unit = " m,ft " decimal digits = " 2 "
QUASOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
SCAMIN	O	decimal digits = " 0 "
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Depth contour

Acronym: **DEPCNT** Code: 43

Type: G

Primitve: L

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: A line connecting points of equal water depth which is sometimes significantly displaced outside of soundings, symbols and other chart detail for clarity as well as generalization. Depth contours, therefore, often represent an approximate location of the line of equal depth as related to the surveyed line delineated on the source. Also referred to as depth curve. (IHO Dictionary, S-32, 5th Edition, 1314, 1315)

Remark: Drying contours are encoded with negative values.

Attribute Bindings:

acronym	usage	constraints
VALDCO	M	unit = " m,ft " decimal digits = " 1 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
SCAMIN	O	
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Dredged area

Acronym: **DRGARE** Code: 46

Type: G

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area of the bottom of a body of water which has been deepened by dredging. (IHO Dictionary, S-32, 5th Edition, 1462)

Remark:

Attribute Bindings:

acronym	usage	constraints
DRVAL1	M	unit = " m,ft " decimal digits = " 2 "
DRVAL2	O	unit = " m,ft " decimal digits = " 2 "
NOBJNM	O	
OBJNAM	O	
QUASOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11 "
SOUACC	O	
TECSOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11,12,13,14 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
SCAMIN	O	decimal digits = " 0 "
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Sounding

Acronym: **SOUNDG** Code: 129

Type: G

Primitve: P

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: A measured water depth or spot which has been reduced to a vertical datum (may be a drying height).

Remark: The value of the sounding is encoded in the 3-D Coordinate field of the Spatial Record Structure (see S-57 Part 3). Drying heights (drying soundings) are indicated by a negative value.

Attribute Bindings:

acronym	usage	constraints
EXPSOU	O	value list = " 1,2,3 "
NOBJNM	O	
OBJNAM	O	
QUASOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11 "
SOUACC	O	decimal digits = " 1 "
TECSOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11,12,13,14 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
SCAMIN	O	decimal digits = " 0 "
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Unsurveyed area

Acronym: **UNSARE** Code: 154

Type: G

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area for which no bathymetric survey information is available.

Remark:

Attribute Bindings:

acronym	usage	constraints
INFORM	O	
NINFOM	O	
NTXTDS	O	
SCAMIN	O	decimal digits = " 0 "
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Accuracy of data

Acronym: **M_ACCY** Code: 300

Type: M

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area within which the best estimate of the overall accuracy of the data is uniform. The overall accuracy takes into account for example the source accuracy, chart scale, digitising accuracy etc..

Remark:

Attribute Bindings:

acronym	usage	constraints
POSACC	O	decimal digits = " 1 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Compilation scale of data

Acronym: **M_CSCL** Code: 301

Type: M

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area within which the data was originally compiled at a uniform scale. For example, it may define the scale of the paper chart from which the data was digitised.

Remark:

Attribute Bindings:

acronym	usage	constraints
CSCALE	M	decimal digits = " 0 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Coverage

Acronym: **M_COVR** Code: 302

Type: M

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: A geographical area that describes the coverage and extent of spatial objects.

Remark:

Attribute Bindings:

acronym	usage	constraints
CATCOV	M	value list = " 1,2 "
INFORM	O	
NINFOM	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Nautical publication information

Acronym: **M_NPUB** Code: 305

Type: M

Primitve: P,A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: Used to relate additional nautical information or publications to the data.

Remark:

Attribute Bindings:

acronym	usage	constraints
INFORM	O	
NINFOM	O	
NTXTDS	O	
PICREP	O	
PUBREF	O	
TXTDSC	O	
SORDAT	O	format = '' ccyymmdd ''
SORIND	O	format = '' cc,cc,ccccc,c... ''

Feature	Quality of data

Acronym: **M_QUAL** Code: 308

Type: M

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area within which a uniform assessment of the quality of the data exists.

Remark:

Attribute Bindings:

acronym	usage	constraints
CATZOC	M	value list = " 1,2,3,4,5,6 "
DRVAL1	O	decimal digits = " 1 "
DRVAL2	O	decimal digits = " 1 "
POSACC	O	decimal digits = " 1 "
SOUACC	O	decimal digits = " 1 "
SUREND	O	format = " ccyymmdd "
SURSTA	O	format = " ccyymmdd "
TECSOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11,12,13,14 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Sounding datum

Acronym: **M_SDAT** Code: 309

Type: M

Primitve: A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area of uniform sounding datum.

Remark:

Attribute Bindings:

acronym	usage	constraints
VERDAT	M	value list = " 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Survey reliability

Acronym: **M_SREL** Code: 310

Type: M

Primitve: L,A

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: An area within which a uniform assessment of the reliability of source survey information exists.

Remark:

Attribute Bindings:

acronym	usage	constraints
QUAPOS	O	value list = " 1,2,3,4,5,6,7,8,9,10,11 "
QUASOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11 "
SDISMN	O	decimal digits = " 0 "
SDISMX	O	decimal digits = " 0 "
SURATH	O	
SUREND	O	format = " ccyymmdd "
SURSTA	O	format = " ccyymmdd "
SURTYP	O	value list = " 1,2,4,5,6 "
TECSOU	O	value list = " 1,2,3,4,5,6,7,8,9,10,11,12,13,14 "
INFORM	O	
NINFOM	O	
NTXTDS	O	
TXTDSC	O	
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Depth area

Acronym: **depare** Code: 17003

Type: G

Primitve: A

Data Dictionary (DD) Reference:

DD Name: IENC Date accepted: 2001-05-31

Definition: A depth area is a water area whose depth is within a defined range of values.

Remark: Intertidal areas are encoded as depth areas. These do not have to include soundings. The depth range within a depth area is defined by the attributes 'DRVAL1' and 'DRVAL2'.

Attribute Bindings:

acronym	usage	constraints
DRVAL1	M	unit = " m,ft " decimal digits = " 2 "
DRVAL2	M	unit = " m,ft " decimal digits = " 2 "
eleva1	C	unit = " m,ft " decimal digits = " 2 "
eleva2	C	unit = " m,ft " decimal digits = " 2 "
QUASOU	C	value list = " 1,2,3,4,5,6,7,8,9,10,11 "
hunits	M	value list = " 1,2,3,4,5,6 "
wtwdis	M	decimal digits = " 3 "
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Feature	Sounding datum

Acronym: **m_sdat** Code: 17022

Type: M

Primitve: A

Data Dictionary (DD) Reference:

DD Name: IENC Date accepted: 2001-05-31

Definition: An area of uniform sounding datum.

Remark:

Attribute Bindings:

acronym	usage	constraints
verdat	M	value list = " 12,31,32,33,34,35,36,37,38,39,40 "
SORDAT	O	format = " ccyymmdd "
SORIND	O	format = " cc,cc,ccccc,c... "

Attribute	Category of coverage

Acronym: **CATCOV** Code: 18

Use Type: F

Value Type: E

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition:

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: CATCOV_1 Date accepted: 2000-11-01 Name: coverage available Definition: continuous coverage of spatial objects is available within this area.
2	DD Name: HYDRO Code: CATCOV_2 Date accepted: 2000-11-01 Name: no coverage available Definition: an area containing no spatial objects.

Attribute	Category of zone of confidence in data

Acronym: **CATZOC** Code: 72

Use Type: F

Value Type: E

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition:

Remark: The CATZOC attribute definitions are currently the subject of review and the results of this review will be promulgated as soon as possible in the S-57 Corrections Document. See the CATZOC Table in S-57 for the full table layout.

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: CATZOC_1 Date accepted: 2000-11-01 Name: zone of confidence A1 Definition:
2	DD Name: HYDRO Code: CATZOC_2 Date accepted: 2000-11-01 Name: zone of confidence A2 Definition:
3	DD Name: HYDRO Code: CATZOC_3 Date accepted: 2000-11-01 Name: zone of confidence B Definition:
4	DD Name: HYDRO Code: CATZOC_4 Date accepted: 2000-11-01 Name: zone of confidence C Definition:
5	DD Name: HYDRO Code: CATZOC_5 Date accepted: 2000-11-01 Name: zone of confidence D

Value	Data Dictionary (DD) Reference
	Definition:
6	DD Name: HYDRO Code: CATZOC_6 Date accepted: 2000-11-01
	Name: zone of confidence U (data not assessed)
	Definition:

Attribute	Compilation scale

Acronym: **CSCALE** Code: 80

Use Type: F

Value Type: I

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The scale at which the data was originally compiled.

Remark:

Attribute	Depth range value 1

Acronym: **DRVAL1** Code: 87

Use Type: F

Value Type: F

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The minimum (shoalest) value of a depth range.

Remark: Where the area dries, the value is negative. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

Attribute	Depth range value 2

Acronym: **DRVAL2** Code: 88

Use Type: F

Value Type: F

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The maximum (deepest) value of a depth range.

Remark: Where the area dries, the value is negative. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

Attribute	Exposition of sounding

Acronym: **EXPSOU** Code: 93

Use Type: F

Value Type: E

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2010-08-12

Definition: Indicates objects with a 'value of sounding' not within the range of depth of the surrounding depth area.

Remark: This attribute indicates objects with a 'value of sounding' not within the range of depth of the surrounding depth area. These objects could be a potential danger for navigation.

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: EXPSOU_1 Date accepted: 2010-08-12 Name: within the range of depth of the surrounding depth area Definition: the depth corresponds to the depth range of the surrounding depth area. i.e. the depth is not shoaler than the minimum depth of the surrounding depth area or deeper than the maximum depth of the surrounding depth area.
2	DD Name: HYDRO Code: EXPSOU_2 Date accepted: 2010-08-12 Name: shoaler than the range of depth of the surrounding depth area Definition: the depth is shoaler than the minimum depth of the surrounding depth area.
3	DD Name: HYDRO Code: EXPSOU_3 Date accepted: 2010-08-12 Name: deeper than the range of depth of the surrounding depth area Definition: the depth is deeper than the maximum depth of the surrounding depth area.

Attribute	Information

Acronym: **INFORM** Code: 102

Use Type: F

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: Textual information about the object.

Remark: The textual information could be, for example, a list, a table or a text. This attribute should be used, for example, to hold the information that is shown on paper charts by cautionary and explanatory notes. No formatting of text is possible within INFORM. If formatted text is required, then the attribute TXTDSC must be used.

Attribute	Object name

Acronym: **OBJNAM** Code: 116

Use Type: F

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The individual name of an object.

Remark:

Attribute	Pictorial representation

Acronym: **PICREP** Code: 120

Use Type: F

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: Indicates whether a pictorial representation of the object is available.

Remark: The 'pictorial representation' could be a drawing or a photo. The string encodes the file name of an external graphic file (pixel/vector).

Attribute	Positional Accuracy

Acronym: **POSACC** Code: 401

Use Type: F,S

Value Type: F

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The best estimate of the accuracy of a position. The expected input is the maximum of the two-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.

Remark: The unit of measure is defined in the PUNI subfield of the DSPM record, e.g., metre (m). The resolution is 0.1 m or 0.1 mm.

Attribute	Publication reference

Acronym: **PUBREF** Code: 124

Use Type: F

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: A reference to a nautical publication.

Remark:

Attribute	Quality of sounding measurement

Acronym: **QUASOU** Code: 125

Use Type: F

Value Type: L

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition:

Remark: The attribute 'quality of sounding measurement' indicates the reliability of the value of sounding.

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: QUASOU_1 Date accepted: 2000-11-01 Name: depth known Definition: the depth from chart datum to the bottom is a known value.
2	DD Name: HYDRO Code: QUASOU_2 Date accepted: 2000-11-01 Name: depth unknown Definition: the depth from chart datum to the bottom is unknown.
3	DD Name: HYDRO Code: QUASOU_3 Date accepted: 2000-11-01 Name: doubtful sounding Definition: a depth that may be less than indicated. (adapted from IHO Dictionary, S-32, 5th Edition, 4840)
4	DD Name: HYDRO Code: QUASOU_4 Date accepted: 2000-11-01 Name: unreliable sounding Definition: a depth that is considered to be an unreliable value.
5	DD Name: HYDRO Code: QUASOU_5 Date accepted: 2000-11-01 Name: no bottom found at value shown

Value	Data Dictionary (DD) Reference
	Definition: upon investigation the bottom was not found at this depth. (adapted from IHO Dictionary, S-32, 5th Edition, 4848)
6	DD Name: HYDRO Code: QUASOU_6 Date accepted: 2000-11-01
	Name: least depth known
	Definition: the shoalest depth over a feature is of known value. (adapted from IHO Dictionary, S-32, 5th Edition, 2705)
7	DD Name: HYDRO Code: QUASOU_7 Date accepted: 2000-11-01
	Name: least depth unknown, safe clearance at depth shown
	Definition: the least depth over a feature is unknown, but there is considered to be safe clearance at this depth.
8	DD Name: HYDRO Code: QUASOU_8 Date accepted: 2000-11-01
	Name: value reported (not surveyed)
	Definition: depth value obtained from a report, but not fully surveyed.
9	DD Name: HYDRO Code: QUASOU_9 Date accepted: 2000-11-01
	Name: value reported (not confirmed)
	Definition: depth value obtained from a report, which it has not been possible to confirm.
10	DD Name: HYDRO Code: QUASOU_10 Date accepted: 2000-11-01
	Name: maintained depth
	Definition: the depth at which a channel is kept by human influence, usually by dredging. (IHO Dictionary, S-32, 5th Edition, 3057)
11	DD Name: HYDRO Code: QUASOU_11 Date accepted: 2000-11-01
	Name: not regularly maintained
	Definition: depths may be altered by human influence, but will not be routinely maintained.

Attribute	Scale minimum

Acronym: **SCAMIN** Code: 133

Use Type: F

Value Type: I

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The minimum scale at which the object may be used e.g. for ECDIS presentation.

Remark: The modulus of the scale is indicated, that is 1:1 250 000 is encoded as 1250000.

Attribute	Sounding accuracy

Acronym: **SOUACC** Code: 144

Use Type: F

Value Type: F

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The best estimate of the accuracy of the sounding data. The maximum of the one-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.

Remark: The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

Attribute	Sounding distance - maximum

Acronym: **SDISMX** Code: 145

Use Type: F

Value Type: I

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The maximum spacing of the principal sounding lines of a survey.

Remark:

Attribute	Sounding distance - minimum

Acronym: **SDISMN** Code: 146

Use Type: F

Value Type: I

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The minimum spacing of the principal sounding lines of a survey.

Remark:

Attribute	Source date

Acronym: **SORDAT** Code: 147

Use Type: F

Value Type: S

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The production date of the source, e.g. the date of measurement.

Remark:

Attribute	Source indication

Acronym: **SORIND** Code: 148

Use Type: F

Value Type: S

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: Information about the source of the object.

Remark:

Attribute	Survey authority

Acronym: **SURATH** Code: 150

Use Type: F

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The authority which was responsible for the survey.

Remark: The attribute 'survey authority' encodes the name of the source survey authority.

Attribute	Survey date - end

Acronym: **SURENDCode:** 151

Use Type: F

Value Type: S

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The end date of the survey.

Remark:

Attribute	Survey date - start

Acronym: **SURSTA** Code: 152

Use Type: F

Value Type: S

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The start date of the survey.

Remark:

Attribute	Survey type

Acronym: **SURTYP** Code: 153

Use Type: F

Value Type: L

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition:

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: SURTYP_1 Date accepted: 2000-11-01 Name: reconnaissance / sketch survey Definition: a survey made to a lower degree of accuracy and detail than the chosen scale would normally indicate.
2	DD Name: HYDRO Code: SURTYP_2 Date accepted: 2000-11-01 Name: controlled survey Definition: a thorough survey usually conducted with reference to guidelines.
4	DD Name: HYDRO Code: SURTYP_4 Date accepted: 2000-11-01 Name: examintion survey Definition: a survey principally aimed at the investigation of underwater obstructions and dangers.
5	DD Name: HYDRO Code: SURTYP_5 Date accepted: 2000-11-01 Name: passage survey Definition: a survey where soundings are acquired by vessels on passage.
6	DD Name: HYDRO Code: SURTYP_6 Date accepted: 2000-11-01 Name: remotely sensed

Value Data Dictionary (DD) Reference

Definition: a survey where features have been positioned and delimited using remote sensing techniques.

Attribute	Technique of sounding measurement

Acronym: **TECSOU** Code: 156

Use Type: F

Value Type: L

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition:

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: TECSOU_1 Date accepted: 2000-11-01 Name: found by echo-sounder Definition: the depth was determined by using an instrument that determines depth of water by measuring the time interval between emission of a sonic or ultrasonic signal and return of its echo from the bottom. (adapted from IHO Dictionary, S-32, 1547)
2	DD Name: HYDRO Code: TECSOU_2 Date accepted: 2000-11-01 Name: found by side-scan-sonar Definition: the depth was computed from a record produced by active sonar in which fixed acoustic beams are directed into the water perpendicularly to the direction of travel to scan the bottom and generate a record of the bottom configuration. (adapted from IHO Dictionary, S-32, 4710)
3	DD Name: HYDRO Code: TECSOU_3 Date accepted: 2000-11-01 Name: found by multi-beam Definition: the depth was determined by using a wide swath echo sounder that uses multiple beams to measure depths directly below and transverse to the ship's track. (adapted from IHO Dictionary, S-32, 3339)
4	DD Name: HYDRO Code: TECSOU_4 Date accepted: 2000-11-01 Name: found by diver

Value Data Dictionary (DD) Reference

Definition: the depth was determined by a person skilled in the practice of diving. (adapted from IHO Dictionary, S-32, 1422)

5 DD Name: HYDRO Code: TECSOU_5 Date accepted: 2000-11-01

Name: found by lead-line

Definition: the depth was determined by using a line, graduated with attached marks and fastened to a sounding lead. (adapted from IHO Dictionary, S-32, 2698)

6 DD Name: HYDRO Code: TECSOU_6 Date accepted: 2000-11-01

Name: swept by wire-drag

Definition: the given area was determined to be free from navigational dangers to a certain depth by towing a buoyed wire at the desired depth by two launches, or a least depth was identified using the same technique. (adapted from IHO Dictionary, S-32, 5248, 6013)

7 DD Name: HYDRO Code: TECSOU_7 Date accepted: 2000-11-01

Name: found by laser

Definition: the depth was determined by using an instrument that measures distance by emitting timed pulses of laser light and measuring the time between emission and reception of the reflected pulses. (adapted from IHO Dictionary, S-32, 2763)

8 DD Name: HYDRO Code: TECSOU_8 Date accepted: 2000-11-01

Name: swept by vertical acoustic system

Definition: the given area has been swept using a system comprised of multiple echo sounder transducers attached to booms deployed from the survey vessel.

9 DD Name: HYDRO Code: TECSOU_9 Date accepted: 2000-11-01

Name: found by electromagnetic sensor

Definition: the depth was determined by using an instrument that compares electromagnetic signals. (adapted from IHO Dictionary, S-32, 1571)

10 DD Name: HYDRO Code: TECSOU_10 Date accepted: 2000-11-01

Name: photogrammetry

Definition: the depth was determined by applying mathematical techniques to photographs. (adapted from IHO Dictionary, S-32, 3791)

11 DD Name: HYDRO Code: TECSOU_11 Date accepted: 2000-11-01

Name: satellite imagery

Value	Data Dictionary (DD) Reference
	Definition: the depth was determined by using instruments placed aboard an artificial satellite. (adapted from IHO Dictionary, S-32, 4509)
12	DD Name: HYDRO Code: TECSOU_12 Date accepted: 2000-11-01
	Name: found by levelling
	Definition: the depth was determined by using levelling techniques to find the elevation of the point relative to a datum. (adapted from IHO Dictionary, S-32, 2741)
13	DD Name: HYDRO Code: TECSOU_13 Date accepted: 2000-11-01
	Name: swept by side-scan-sonar
	Definition: the given area was determined to be free from navigational dangers to a certain depth by towing a side-scan-sonar. (adapted from IHO Dictionary, S-32, 5248, 4710) [415.2]
14	DD Name: HYDRO Code: TECSOU_14 Date accepted: 2000-11-01
	Name: computer generated
	Definition: the sounding was determined from a bottom model constructed using a computer.

Attribute	Textual description

Acronym: **TXTDSC** Code: 158

Use Type: F

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The string encodes the file name of an external text file that contains the text in English

Remark: The attribute 'textual description' indicates that a file containing text extracted from relevant pilot books or navigational publications is available.

Attribute	Value of depth contour

Acronym: **VALDCO** Code: 174

Use Type: F

Value Type: F

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The depth of a sea bottom contour.

Remark: Drying contours are indicated by a negative value. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.

Attribute	Vertical datum

Acronym: **VERDAT** Code: 185

Use Type: F

Value Type: E

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2001-05-31

Definition: Vertical datum

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: VERDAT_1 Date accepted: 2000-11-01 Name: Mean low water springs Definition: (MLWS) - the average height of the low waters of spring tides. Also called spring low water. (IHO Dictionary, S-32, 5th Edition, 3150)
2	DD Name: HYDRO Code: VERDAT_2 Date accepted: 2000-11-01 Name: Mean lower low water springs Definition: (MLLWS) - the average height of lower low water springs at a place. (IHO Dictionary, S-32, 5th Edition, 3146)
3	DD Name: HYDRO Code: VERDAT_3 Date accepted: 2000-11-01 Name: Mean sea level Definition: (MSL) - the average height of the surface of the sea at a tide station for all stages of the tide over a 19-year period, usually determined from hourly height readings measured from a fixed predetermined reference level. (IHO Dictionary, S-32, 5th Edition, 3156)
4	DD Name: HYDRO Code: VERDAT_4 Date accepted: 2000-11-01 Name: Lowest low water Definition: an arbitrary level conforming to the lowest tide observed at a place, or some what lower.

Value	Data Dictionary (DD) Reference
5	DD Name: HYDRO Code: VERDAT_5 Date accepted: 2000-11-01 Name: Mean low water Definition: (MLW) - the average height of all low waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3147)
6	DD Name: HYDRO Code: VERDAT_6 Date accepted: 2000-11-01 Name: Lowest low water springs Definition: an arbitrary level conforming to the lowest water level observed at a place at spring tides during a period of time shorter than 19 years. (Hydrographic Service, Royal Australian Navy)
7	DD Name: HYDRO Code: VERDAT_7 Date accepted: 2000-11-01 Name: Approximate mean low water springs Definition: an arbitrary level, usually within " 0.3m from that of mean low water springs (MLWS). (Hydrographic Service, Royal Australian Navy)
8	DD Name: HYDRO Code: VERDAT_8 Date accepted: 2000-11-01 Name: Indian spring low water Definition: (ISLW) - an arbitrary tidal datum approximating the level of the mean of the lower low water at spring tides. Also called Indian tidal plane. (IHO Dictionary, S-32, 5th Edition, 2427) A tidal datum approximating the lowest water level observed at a place, originated by G.H. Darwin for the tides of India at a level below MSL being equal to the sum of amplitudes of the harmonic constituents M2, S2, K1 and O1; usually below that of the lower low water at spring tides. Also called Indian tide plane. (Hydrographic Service, Royal Australian Navy).
9	DD Name: HYDRO Code: VERDAT_9 Date accepted: 2000-11-01 Name: Low water springs Definition: an arbitrary level, approximating that of mean low water springs (MLWS). (Hydrographic Service, Royal Australian Navy)
10	DD Name: HYDRO Code: VERDAT_10 Date accepted: 2000-11-01 Name: Approximate lowest astronomical tide Definition: an arbitrary level, usually within " 0.3m from that of lowest astronomical tide (LAT). (Hydrographic Service, Royal Australian Navy)
11	DD Name: HYDRO Code: VERDAT_11 Date accepted: 2000-11-01 Name: Nearly lowest low water

Value Data Dictionary (DD) Reference

Definition: an arbitrary level approximating the lowest water level observed at a place, usually equivalent to the Indian spring low water (ISLW). (Hydrographic Service, Royal Australian Navy)

12 DD Name: HYDRO Code: VERDAT_12 Date accepted: 2000-11-01

Name: Mean lower low water

Definition: (MLLW) - the average height of the lower low waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3145)

13 DD Name: HYDRO Code: VERDAT_13 Date accepted: 2000-11-01

Name: Low water

Definition: an approximation of mean low water adopted as the reference level for a limited area, irrespective of better determinations at a later date. Used mostly in harbour and river engineering. Used in inland (non-tidal) waters. It is generally defined as a level which the daily mean water level would fall below less than 5% of the time and by no more than 0.2 metres during the navigation season. A single level surface is usually chosen as the low water datum for a whole lake. On a river, low water datum is a sloping surface which approximates the river surface at a low state. (Canadian Hydrographic Service)

14 DD Name: HYDRO Code: VERDAT_14 Date accepted: 2000-11-01

Name: Approximate mean low water

Definition: an arbitrary level, usually within " 0.3m from that of mean low water (MLW). (Hydrographic Service, Royal Australian Navy)

15 DD Name: HYDRO Code: VERDAT_15 Date accepted: 2000-11-01

Name: Approximate mean lower low water

Definition: an arbitrary level, usually within " 0.3m from that of mean lower low water (MLLW). (Hydrographic Service, Royal Australian Navy)

16 DD Name: HYDRO Code: VERDAT_16 Date accepted: 2000-11-01

Name: Mean high water

Definition: (MHW) - the average height of all high waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3141)

17 DD Name: HYDRO Code: VERDAT_17 Date accepted: 2000-11-01

Name: Mean high water springs

Definition: (MHWS) - the average height of the high waters of spring tides. Also called spring high water. (IHO Dictionary, S-32, 5th Edition, 3144)

Value	Data Dictionary (DD) Reference
18	DD Name: HYDRO Code: VERDAT_18 Date accepted: 2000-11-01 Name: High water Definition: the highest level reached at a place by the water surface in one tidal cycle. Also called high tide. (IHO Dictionary, S-32, 5th Edition, 2251) when used on inland (non-tidal) waters it is generally defined as a level which the daily mean water level exceeds less than 5% of the time.
19	DD Name: HYDRO Code: VERDAT_19 Date accepted: 2000-11-01 Name: Approximate mean sea level Definition: an arbitrary level, usually within " 0.3m from that of mean sea level (MSL). (Hydrographic Service, Royal Australian Navy)
20	DD Name: HYDRO Code: VERDAT_20 Date accepted: 2000-11-01 Name: High water springs Definition: an arbitrary level, approximating that of mean high water springs (MHWS). (Hydrographic Service, Royal Australian Navy)
21	DD Name: HYDRO Code: VERDAT_21 Date accepted: 2000-11-01 Name: Mean higher high water Definition: (MHHW) - the average height of higher high waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3140)
22	DD Name: HYDRO Code: VERDAT_22 Date accepted: 2000-11-01 Name: Equinoctial spring low water Definition: the level of low water springs near the time of an equinox.
23	DD Name: HYDRO Code: VERDAT_23 Date accepted: 2000-11-01 Name: Lowest astronomical tide Definition: (LAT) - the lowest tide level which can be predicted to occur under average meterological conditions and under any combination of astronomical conditions. (IHO Dictionary, S-32, 5th Edition, 2936)
24	DD Name: HYDRO Code: VERDAT_24 Date accepted: 2000-11-01 Name: Local datum Definition: an arbitrary datum defined by a local harbour authority, from which levels and tidal heights are measured by this authority.

Value	Data Dictionary (DD) Reference
25	DD Name: HYDRO Code: VERDAT_25 Date accepted: 2000-11-01 Name: International Great Lakes Datum 1985 Definition: (IGLD 1985) - a vertical reference system with its zero based on the mean water level at Rimouski/Pointe-au-Pere, Quebec, over the period 1970 to 1988.
26	DD Name: HYDRO Code: VERDAT_26 Date accepted: 2000-11-01 Name: Mean water level Definition: the average of all hourly water levels over the available period of record.
27	DD Name: HYDRO Code: VERDAT_27 Date accepted: 2000-11-01 Name: Lower low water large tide Definition: (LLWLT) - the average of the lowest low waters, one from each of 19 years of observations.
28	DD Name: HYDRO Code: VERDAT_28 Date accepted: 2000-11-01 Name: Higher high water large tide Definition: (HHWLT) - the average of the highest high waters, one from each of 19 years of observations.
29	DD Name: HYDRO Code: VERDAT_29 Date accepted: 2000-11-01 Name: Nearly highest high water Definition: an arbitrary level approximating the highest water level observed at a place, usually equivalent to the high water springs.
30	DD Name: HYDRO Code: VERDAT_30 Date accepted: 2000-11-01 Name: Highest astronomical tide (HAT) Definition: the highest tidal level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions. (IHO Dictionary, S-32, 5th Edition, 2244).

Attribute	Information in national language

Acronym: **NINFOM** Code: 300

Use Type: N

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: Textual information in national language characters

Remark: The attribute 'information in national language' encodes any textual information about an object using a specified national language. The textual information could be, for example, a list, a table or a text. This attribute should be used, for example, to hold the information that is shown on paper charts by cautionary and explanatory notes.

Attribute	Object name in national language

Acronym: **NOBJNM** Code: 301

Use Type: N

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: Name of object in national language characters

Remark: The attribute 'object name in national language' encodes the individual name of an object in the specified national language.

Attribute	Textual description in national language

Acronym: **NTXTDS** Code: 304

Use Type: N

Value Type: T

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition: The file name of an external text file that contains the text in a national language.

Remark: The attribute 'textual description in national language' indicates whether a text file containing text extracted from relevant pilot books or navigational publications is available.

Attribute	Quality of position

Acronym: **QUAPOS** Code: 402

Use Type: F,S

Value Type: E

Data Dictionary (DD) Reference:

DD Name: HYDRO Date accepted: 2000-11-01

Definition:

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: HYDRO Code: QUAPOS_1 Date accepted: 2000-11-01 Name: surveyed Definition: the position(s) was(were) determined by the operation of making measurements for determining the relative position of points on, above or beneath the earth=s surface. Survey implies a regular, controlled survey of any date. (adapted from IHO Dictionary, S-32, 5195, and IHO Chart Specifications, M-4, 175.2)
2	DD Name: HYDRO Code: QUAPOS_2 Date accepted: 2000-11-01 Name: unsurveyed Definition: survey data is does not exist or is very poor. (adapted from IHO Dictionary, S-32, 5732)
3	DD Name: HYDRO Code: QUAPOS_3 Date accepted: 2000-11-01 Name: inadequately surveyed Definition: position data is of a very poor quality. (adapted from IHO Dictionary, S-32, 5732)
4	DD Name: HYDRO Code: QUAPOS_4 Date accepted: 2000-11-01 Name: approximated Definition: a position that is considered to be less than third-order accuracy, but is generally considered to be within 30.5 metres of its correct geographic location. Also may apply to an

Value	Data Dictionary (DD) Reference
	object whose position does not remain fixed. (adapted from IHO Dictionary, S-32, 213, 3967, and IHO Specifications, M-4, 424.1)
5	DD Name: HYDRO Code: QUAPOS_5 Date accepted: 2000-11-01
	Name: position doubtful
	Definition: an object whose position has been reported but which is considered to be doubtful.
6	DD Name: HYDRO Code: QUAPOS_6 Date accepted: 2000-11-01
	Name: unreliable
	Definition: an object=s position obtained from questionable or unreliable data.
7	DD Name: HYDRO Code: QUAPOS_7 Date accepted: 2000-11-01
	Name: reported (not surveyed)
	Definition:
8	DD Name: HYDRO Code: QUAPOS_8 Date accepted: 2000-11-01
	Name: reported (not confirmed)
	Definition: an object whose position has been reported and its position confirmed by some means other than a formal survey such as an independent report of the same object.
9	DD Name: HYDRO Code: QUAPOS_9 Date accepted: 2000-11-01
	Name: estimated
	Definition: the most probable position of an object determined from incomplete data or data of questionable accuracy. (adapted from IHO Dictionary, S-32, 3960)
10	DD Name: HYDRO Code: QUAPOS_10 Date accepted: 2000-11-01
	Name: precisely known
	Definition: a position that is of a known value, such as the position of an anchor berth or other defined object.
11	DD Name: HYDRO Code: QUAPOS_11 Date accepted: 2000-11-01
	Name: calculated
	Definition: a position that is computed from data.

Attribute	Vertical datum

Acronym: **verdat** Code: 17005

Use Type: F

Value Type: E

Data Dictionary (DD) Reference:

DD Name: IENC Date accepted: 2001-05-31

Definition: Vertical datum

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
12	DD Name: IENC Code: verdat_12 Date accepted: 2001-05-31 Name: Mean lower low water Definition: (MLLW) - the average height of the lower low waters at a place over a 19-year period. (IHO Dictionary, S-32, 5th Edition, 3145)
31	DD Name: IENC Code: verdat_31 Date accepted: 2001-05-31 Name: Local low water reference level Definition: low water reference level of the local area
32	DD Name: IENC Code: verdat_32 Date accepted: 2001-05-31 Name: Local high water reference level Definition: high water reference level of the local area
33	DD Name: IENC Code: verdat_33 Date accepted: 2001-05-31 Name: Local mean water reference level Definition: mean water reference level of the local area
34	DD Name: IENC Code: verdat_34 Date accepted: 2001-05-31 Name: Equivalent height of water (German GlW)

Value Data Dictionary (DD) Reference

Definition: A low water level which is the result of a defined low water discharge - called "equivalent discharge".

35 DD Name: IENC Code: verdat_35 Date accepted: 2001-05-31

Name: Highest Shipping Height of Water (German HSW)

Definition: upper limit of water levels where navigation is allowed

36 DD Name: IENC Code: verdat_36 Date accepted: 2001-05-31

Name: Reference low water level according to Danube Commission

Definition: The water level at a discharge, which is exceeded 94 % of the year within a period of 30 years.

37 DD Name: IENC Code: verdat_37 Date accepted: 2001-05-31

Name: Highest shipping height of water according to Danube Commission

Definition: The water level at a discharge, which is exceeded 1 % of the year within a period of 30 years.

38 DD Name: IENC Code: verdat_38 Date accepted: 2001-05-31

Name: Dutch river low water reference level (OLR)

Definition: The water level at a discharge, which is exceeded 95 % of the year within a period of 20 years.

39 DD Name: IENC Code: verdat_39 Date accepted: 2001-05-31

Name: Russian project water level

Definition: Conditional low water level with established probability (Hydrographic Terminology Dictionary, HDNO, 1984).

40 DD Name: IENC Code: verdat_40 Date accepted: 2001-05-31

Name: Russian normal backwater level

Definition: Highest water level derived from the upper backwater stream in watercourse or reservoir under the normal operational conditions. (Hydrographic Terminology Dictionary, HDNO, 1984).

41 DD Name: IENC Code: verdat_41 Date accepted: 2001-05-31

Name: Ohio River Datum

Definition:

Attribute	Waterway distance

Acronym: **wtwdis** Code: 17064

Use Type: F

Value Type: F

Data Dictionary (DD) Reference:

DD Name: IENC Date accepted: 2001-05-31

Definition: The distance measured from an origin of a river or canal

Remark:

Attribute	Height/length units

Acronym: **hunits** Code: 17103

Use Type: F

Value Type: E

Data Dictionary (DD) Reference:

DD Name: IENC Date accepted: 2001-05-31

Definition: Units of measure of waterway distances

Remark:

Enumerations

Value	Data Dictionary (DD) Reference
1	DD Name: IENC Code: hunits_1 Date accepted: 2001-05-31 Name: metres Definition: heights/lengths are specified in metres (SI units of length)
2	DD Name: IENC Code: hunits_2 Date accepted: 2001-05-31 Name: feet Definition: heights/lengths are specified in feet (imperial units of length)
3	DD Name: IENC Code: hunits_3 Date accepted: 2001-05-31 Name: kilometres Definition: heights/lengths are specified in kilometres (1000 metres)
4	DD Name: IENC Code: hunits_4 Date accepted: 2001-05-31 Name: hectometres Definition: heights/lengths are specified in hectometres (100 metres)
5	DD Name: IENC Code: hunits_5 Date accepted: 2001-05-31 Name: statute miles Definition: heights/lengths are specified in statue (land) miles

Value	Data Dictionary (DD) Reference
6	DD Name: IENC Code: hunits_6 Date accepted: 2001-05-31
	Name: nautical miles
	Definition: heights/lengths are specified in nautical (sea) miles