Vertical Datum Information in S-101

S-101 PT Chair Thomas RICHARDSON

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- At the S-101PT9 meeting in November 2022 NIWC raised the issue that S-100 does not clearly describe how Metadata is inherited or overridden within a dataset

NIWC Paper INF 01 to S-101PT9

- Currently in S-57 vertical datums (as one example) are defined in the header DSID field, using Meta objects and on specific objects as attribute values

- S-101 1.1.0 has not significantly changed this and no clear mapping has been defined (as in S-57)

- The S-101 1.1.0 Release Notes include this issue as item 10

Field	Subfield	Meta object class	Meta object attribute	Geo or spatial object attribute
DSID	AGEN	The use of M_PROD is prohibited		
DSID	UADT	The use of M_PROD is prohibited		
DSID	ISDT	The use of M_PROD is prohibited		
DSPM	HDAT	The use of M_HDAT is prohibited		The use of HORDAT is prohibited
DSPM	VDAT	M_VDAT	VERDAT	VERDAT
DSPM	SDAT	M_SDAT	VERDAT	VERDAT
DSPM	CSCL	M_CSCL	CSCALE	
DSPM	DUNI	The use of M_UNIT is prohibited		The use of DUNITS is prohibited
DSPM	HUNI	The use of M_UNIT is prohibited		The use of HUNITS is prohibited
DSPM	PUNI	The use of M_UNIT is prohibited		The use of PUNITS is prohibited
		M_ACCY	HORACC	HORACC
		M_ACCY	POSACC	POSACC
		M_ACCY	SOUACC	SOUACC
		M_ACCY	VERACC	VERACC
		M_NSYS	MARSYS	MARSYS
		M_NSYS	ORIENT	Attribute ORIENT of an individual object does not supersede the meta object attribute.
		M_QUAL	CATZOC	POSACC,SOUACC and TECSOU
		M_QUAL	SOUACC	SOUACC
		M_QUAL	POSACC	POSACC
		M_SREL	SURATH	SORIND
		M_SREL	SUREND	SORDAT
		M_SREL	SURSTA	SORDAT
		M_SREL	TECSOU	TECSOU

- ECDIS requires that vertical datums are shown in the legend currently the implicit definition of these values in various places adds to complexity and reduces the scope for machine readability

S-52 6.1.1 Ref 2.3.1g.5 PL 4.0.3 Part 1 10.6.2

S-98 Annex C C-9.1.6.5 and C-12.10.3

- S-98 Water Level Adjustment may be complicated by this
- Uncertainty Portrayal/Alerts & Indications

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1. NIWC Presented 3 Options

Option A • remove inheritance / override concept • store attribute values on each feature

Option B • remove inheritance / override concept • store attribute values in separate feature or information types • associated with each feature

Option C • Provide a mapping table (via an information type)

- Proceed with Option B for S-101 1.2.0

  1. Remove default value from CRSH field in S-101 to remove confusion datums applicable to geometry remain

  2. Retain existing Meta features but require complete coverage of the Data Coverage (conversion tools will need to create new features)

  3. Use an association to connect geo features to meta features where an override is used (e.g. vertical clearances) (impact on conversion tools, validation check needed to enforce)

  4. Add an additional information type to allow the relationship to another datum to be included for example from a sounding datum to a geoidal reference frame

- This solution builds in some way on the approach for Quality of Bathymetric data

- It supports the requirements by and reduces the need for hard coding

- It further improves the usability of S-101 data outside of ECDIS as Metadata will be more clearly structured and can be related to other reference frames

- Although encoders and conversion tools will be impacted the logic can be defined and validation checks can enforce this

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QUESTIONS ?